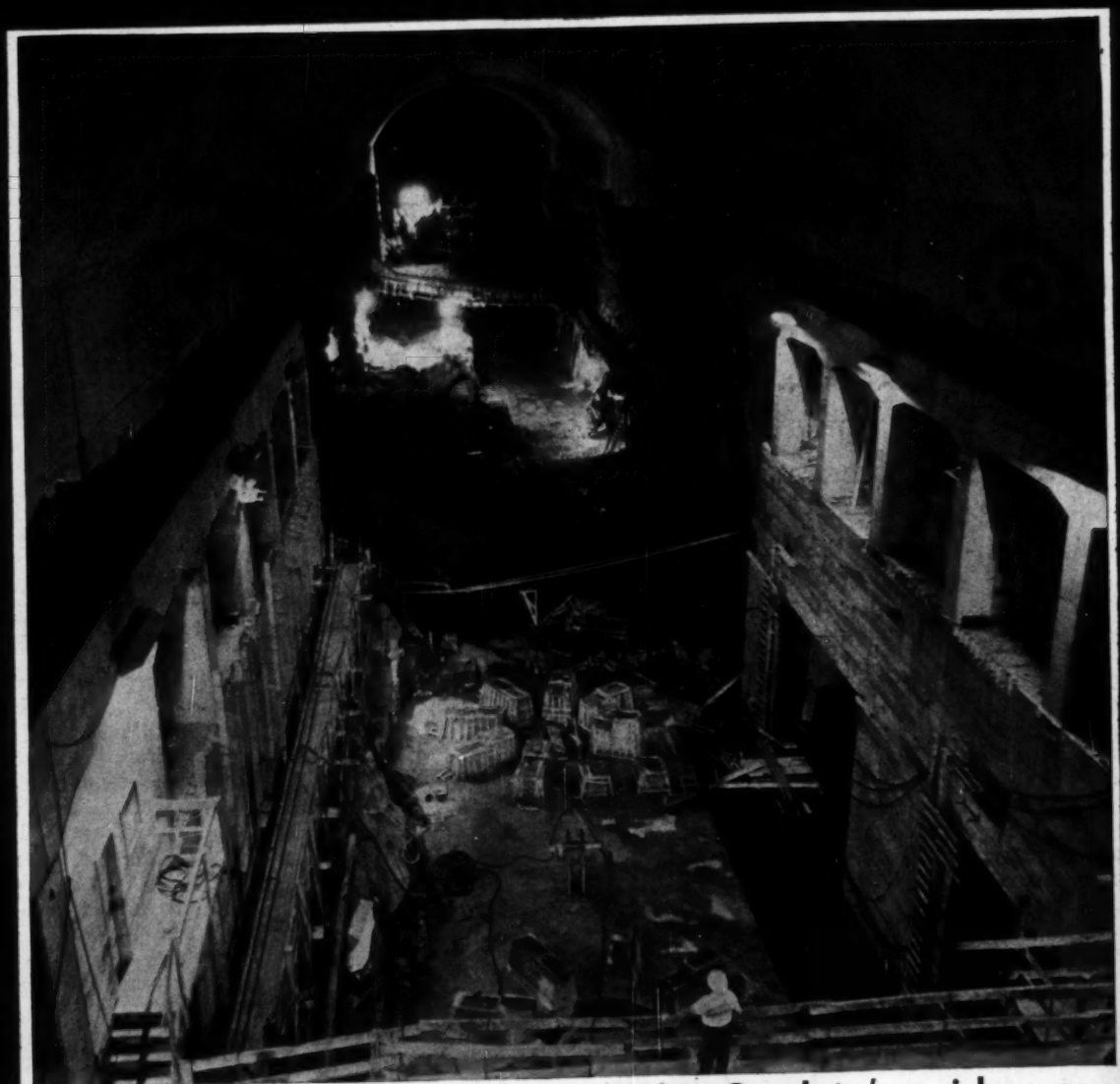
ENGINEERING NEWS-RECORD



Underground powerhouse, Hydro-Quebec's pride *p. 34*

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A McGRAW HILL PUBLICATION

WROUGHT IRON PUTS A STOP TO CORROSION ON THE NEW JERSEY TURNPIKE

CORROSION-RESISTANT WROUGHT IRON USED FOR BLAST PLATES, DRAINAGE LINES, ELECTRICAL CONDUIT

Premature failures from corrosion are brought to a stop on the 118-mile New Jersey Turnpike. This designed-for-durability feature, plus the expressway's ability to accommodate future traffic demands, are two good reasons why this ultra-modern turnpike rates the honor, "A Highway for Tomorrow." An excellent example of the selective use of construction materials to assure continued operation is the extensive use of wrought iron.

Time-proved wrought iron blast plates are used to protect structures on all railroad crossings. Wrought iron conduit, over 120,000 feet of it, serves and safeguards the underground electrical power distribution systems for toll plazas, service areas, and utility buildings. And to assure long-life service in storm drainage lines, the designers applied the extra durability of wrought iron to this job in many of the sections.

Howard, Needles, Tammen and Bergendorff, N.Y., are General Consultants for the entire Turnpike Authority.

Our booklet, *Wrought Iron for Highway Construction*, defines the reasons for this material's unique ability to resist corrosion, and describes a variety of highway services where wrought iron has served and saved. Write for your copy.

A. M. Byers Company, Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, San Francisco. International Division: New York, N.Y.

Available throughout the world.

WHY WROUGHT IRON LASTS LONGER

Tiny threads of glass-like iron silicate, distributed through the body of high-purity iron, give wrought iron the unique structure which makes it highly corrosion resistant. These glass-like fibers—more than 250,000 to each cross-sectional square inch—discourage pitting and rapid penetration because they are immune to corrosive attack. They also anchor the initial protective scale, which shields the underlying metal.

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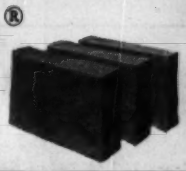
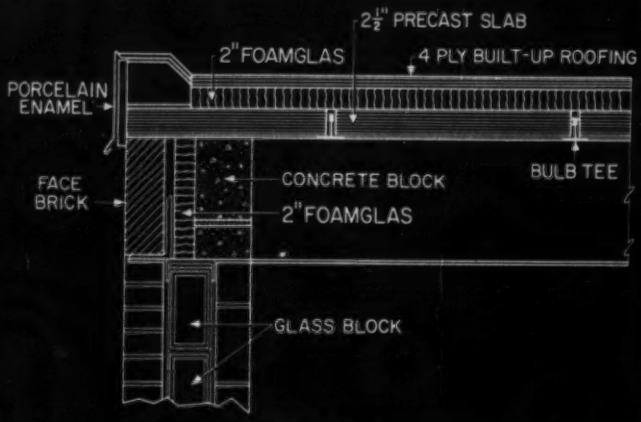
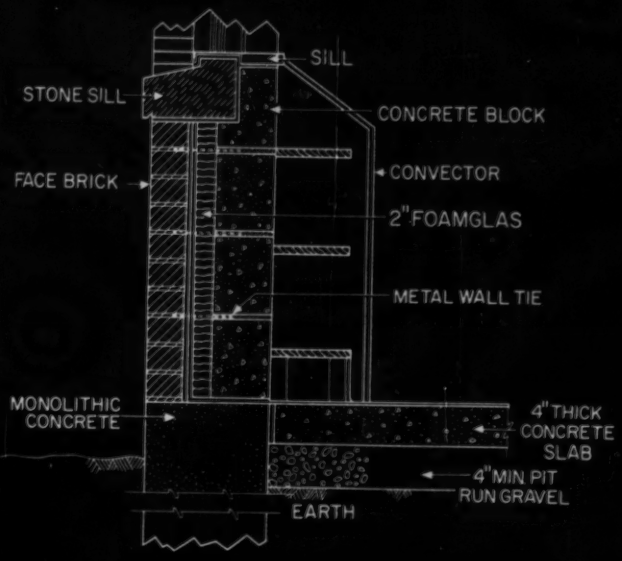
the cellular, stay-dry insulation





TYPICAL ROOF SECTION



TYPICAL COREWALL SECTION

Architect: Thomas A. McConnaughey, Muncie, Ind.
General Contractor: Glaser & Glaser Inc., Muncie, Ind.
Roofing Contractor: Adams Roofing & Insulating Co., Inc., Muncie, Ind.

At new Parkside School, Hartford City, Indiana . . .

FOAMGLAS roof and wall insulation makes electric heating system practical

The new Parkside School at Hartford City, Indiana was designed to take full advantage of the low installation cost and the operating economies possible with electric heating. According to architect T. A. McConnaughey, *stay-dry* FOAMGLAS roof and wall insulation was a major factor in making that type of heating system practical at Parkside. He says:

"Constantly effective building insulation is a 'must' for maximum operating efficiency of an electric heating system. We picked FOAMGLAS because it can't absorb the moisture that destroys the effectiveness of ordinary insulations. We can depend on it to retain its original insulating value continuously. Once installed, we can forget it."

Mr. McConnaughey concludes, "FOAMGLAS also gave us these construction bonuses: Its strength and rigidity prevent it from sagging or buckling after installation. Its fireproofness means added building safety. The ease with which it can be fabricated made it possible for us to imbed electric conduits in the under surface of the roof insulation . . . without impairing performance."

Parkside School is one of hundreds across the country where FOAMGLAS furnishes *dependable*, *long-lasting* insulating protection . . . not only for roofs and walls, but for ceilings, floors, piping and equipment as well. Why not find out today how *you* can best use this unique cellular glass insulation in your designs for schools and other insulated buildings. Write us for a sample and detailed literature.

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Pittsburgh 22, Pennsylvania
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Workman is shown grooving the under surface of FOAMGLAS block to accommodate electric conduit. Cutting into the block's surface does not affect its moisture resistance.

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De Buse Bros., Form Erectors.

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Robert F. Boger
Publisher

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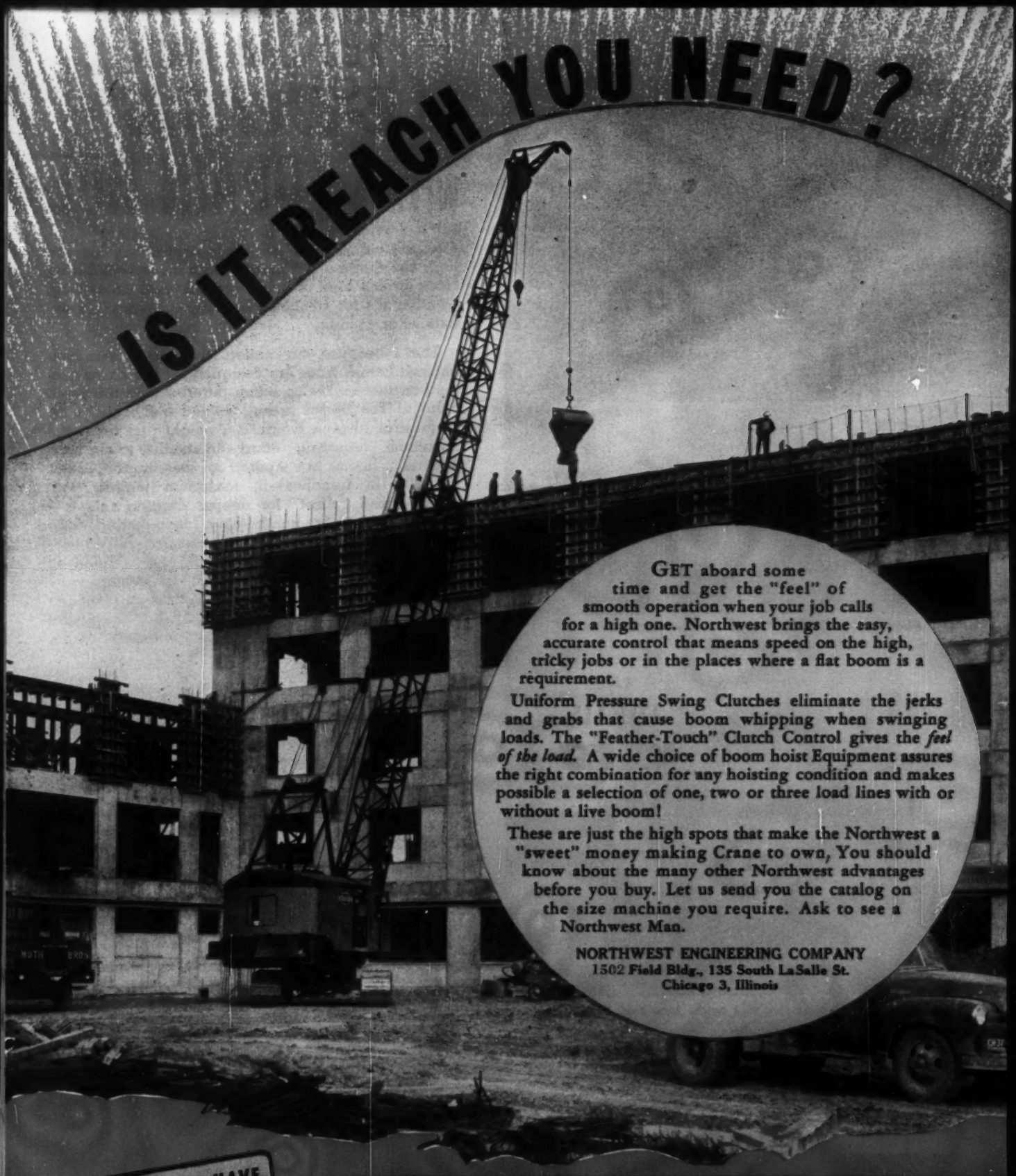

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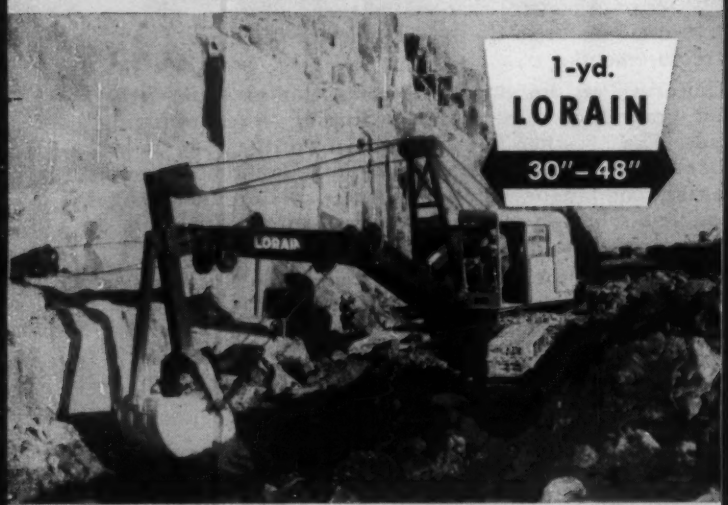
Above: Digging through 14 to 22 ft. of unshot shale.



Above: Digging through shot rock on the New York Thruway.

Below: This Lorain digs sewer trench through 12 ft. of rock.

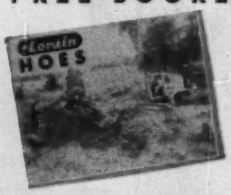
YOU CAN MAKE *DOUGH* WITH A LORAIN HOE

Cost-conscious, profit-conscious contractors learned long ago that there is money to be made with Lorain Hoes on any kind of below-ground level excavating, whether it's for trenches, basements, footings, foundations or grading.

That's because, no matter what size Lorain you choose, Lorain Hoes are designed for the *extra* production that makes so much difference in the profit column. The booms are all-welded box sections for extra strength and weight . . . weight that gives the maximum "crowding" effort and stability to dig hard materials. Booms are tapered for maximum operator visibility in trenches—in maximum lengths with goosenecked "offset" for deeper digging ranges—and the buckets are non-heeling, clean-cutting, easy-dumping. Available in bucket widths from 20" to 62", in a range for each class of machine—mounted on crawler, Self-Propelled, or Moto-Crane carriers—there is the widest possible choice of sizes and mountings to fit your needs. Of course, Lorain hoe booms are easily interchangeable with clamshell, crane, dragline or shovel.

If it's a job for a hoe—big or small—let your Thew-Lorain Distributor show you why you can make dough with a Lorain Hoe.

FREE BOOKLET ON LORAIN HOES



See how contractors, large and small, make money with Lorain Hoes. Send for this booklet containing big pictures of Lorain Hoes in action with interesting job facts and figures. Write for your copy today!

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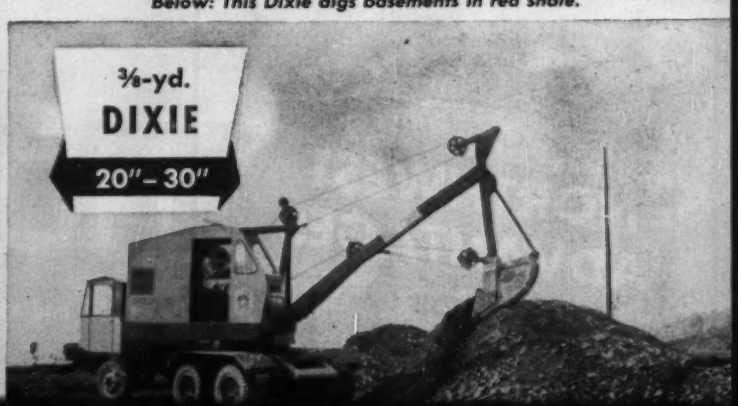
Below: This Dixie digs basements in red shale.



"We save 8% to 15% on Construction costs with Amvit Jointed Clay Pipe"

Says John B. Kelly, President, C. & T. Affiliates, Inc.

"Amvit Jointed Vitrified Clay Pipe cuts costs and speeds construction," says John B. Kelly, President, C. & T. Affiliates, Inc. "We save from 8 to 15 percent on costs when we install Amvit Jointed Clay Pipe."

"The Amvit Joint is built in, ready for installation. Since no special preparations are needed, the line is laid quickly and easily. Immediate backfilling is possible."

City of Camden, N.J.

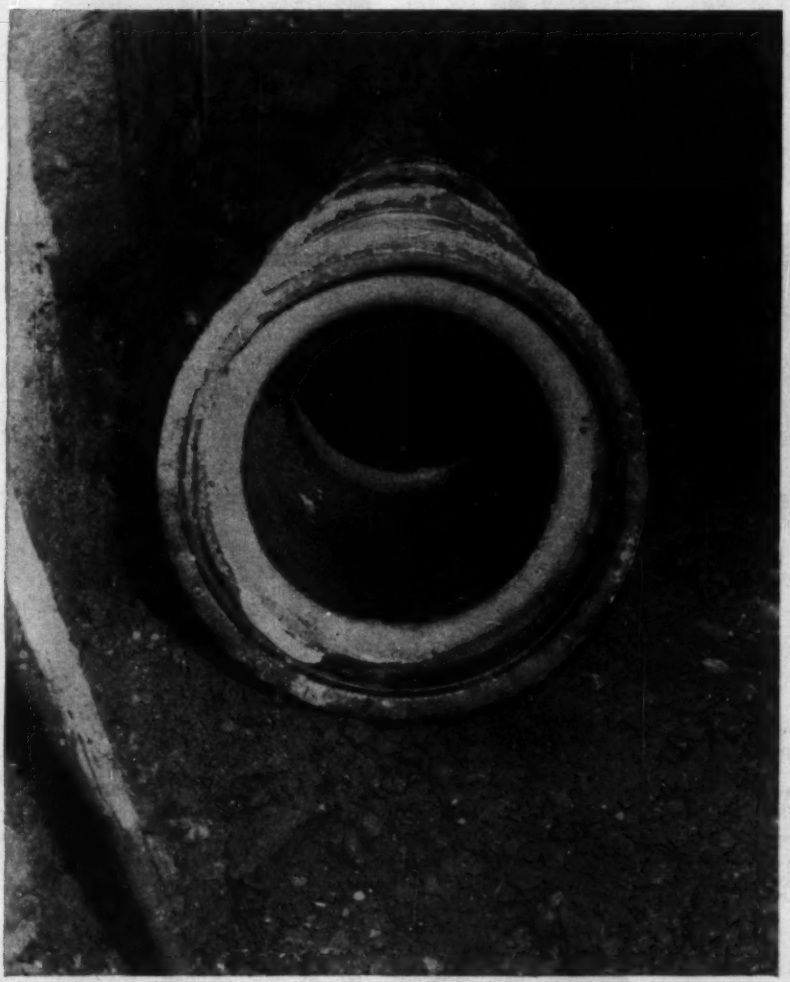
City Engineer
George Rogers

Assistant City Engineer
John Morgan

When the pipe is "pushed" together, the joint is in constant compression. Water cannot force its way in or out, thus preventing costly ground water infiltration or root penetration.

Amvit Jointed Clay Pipe is just one of the many products manufactured in our plants across the nation. American Vitrified Products Company also produces concrete pipe, clay pipe, flue liners—both glazed and unglazed, and clay liner plates.

For more information, write or call American Vitrified Products Company, National City Bank Building, Cleveland, Ohio, or our office nearest you.



The Amvit joint is made of a new acid resistant plastic material with rubber characteristics. Like the pipe, the joints will not be harmed by any condition of underground service. The pipe is simply pushed together. The trench is then ready for backfilling.

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These Miller Welders feature the patented Miller UNITRAN control circuit which combines the transformer with its own integral flux diverter. This, in conjunction with adequate open circuit voltage, high frequency, balancing resistor and optional controls insures superior uniformity and flexibility throughout the entire welding range. Available in nine models.

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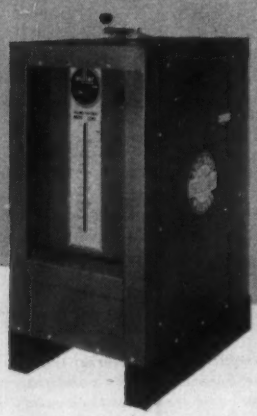
Available in 14 models, this new Miller Welder provides both AC and DC welding power for applications where both are required. It operates from a single phase power line and is available with high frequency and controls designed especially for inert gas arc and spot welding.



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Why Isbell uses TIMKEN® carbide insert bits in drilling Jasper and Dolomitic limestone

IN drilling operations at the Van Stone Mine, Northport, Washington, Isbell Construction Company found it more effective to use Timken® carbide insert bits to drill hard Jasper and Dolomitic limestone.

In such extremely hard, abrasive ground, where a steel bit will not drill out a full increment of drill steel, Timken carbide insert bits speed the operation. Because of their large cross-section of carbide, they allow the most reconditionings per bit, and maintain their original gauge longer. They're most economical for constant-gauge holes, small-diameter holes, and extremely deep holes.

But Timken carbide insert bits may not be the best solution to *all* your drilling problems.

In ordinary ground, for instance, Timken multi-use bits are most economical. With correct and controlled reconditioning, they give the lowest cost per foot of hole when full increments of steel can be drilled.

Both types of Timken rock bits are made from Timken fine alloy steel, made in electric furnaces. No other rock bit manufacturer takes the extra quality control step of making his own steel.

Many different Timken carbide insert and multi-use bits are interchangeable in the same thread series, so drillers can change bit types quickly and easily as the ground changes—right on the job. And, because of the special shoulder union developed by the Timken Company, the threads on both multi-use and carbide insert bits are protected against damage due to drilling impact.

Our rock bit engineering specialists can help you select the right bit for your particular needs. They possess more than twenty years of on-the-job drilling experience. Take advantage of this extra service. Call or write the Timken Rock Bit Engineering Service, The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

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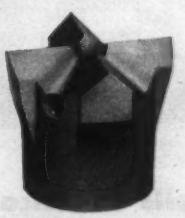

Timken threaded multi-use rock bit

Timken threaded carbide insert rock bit

HYDRAULICS FOR MOBILE EQUIPMENT

VOL. 2

Mobile Equipment News

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IMPROVES PERFORMANCE • CUTS COSTS

NO. 4

VICKERS® VT16 PUMP NOW AVAILABLE FOR HYDRAULIC POWER STEERING OF TRUCKS AND MATERIALS HANDLING VEHICLES

The Vickers Series VT16 pump is used more widely than all other makes combined for the power steering of automobiles. It is now available for the first time for the hydraulic power steering of trucks and materials handling vehicles. It has all the characteristics important to this service and is used in a separate hydraulic circuit for steering only.

COMPLETE PACKAGE

Series VT16 has integral volume control valve and relief valve . . . also an integral oil reservoir. This is a complete hydraulic power package for steering.

SIMPLIFIED INSTALLATION

This compact and complete power package is easily and quickly installed. All you need to do is bolt it on, make two hydraulic connections, and couple the power.

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The exclusive Vickers "Hydraulic Balance" eliminates pressure-induced bearing loads and the consequent wear. These lighter bearing loads mean much longer bearing and pump life.

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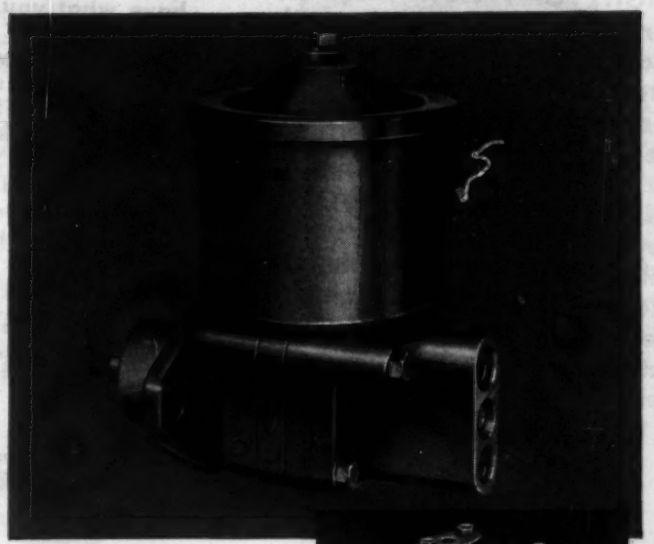
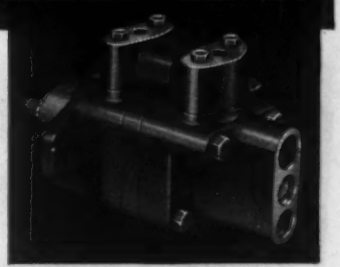


Series VT16 Vickers Pump with integral volume control and relief valves and oil reservoir. For hydraulic power steering.

HIGH OPERATING EFFICIENCY

The vane type construction, hydraulic balance and automatic maintenance of optimum running clearances enable these pumps to deliver more oil with less power. This high operating efficiency is maintained throughout the long pump life.



Series VT17 Vickers Pump is similar to the VT 16 except that it does not include the oil reservoir.

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T-500
125 H.P.
25,000 lbs.
with scarifiers

WEIGHT FOR WEIGHT they have more "PUSH-POWER" at the blade than any other motor graders built. They are also the most productive and easiest to operate, because they have what you've always wanted — POWER BALANCED TO MATCH WEIGHT. They utilize their power without useless, costly spinning of the drive wheels. Every part is designed for size, weight, strength, and type of metal to function in proportion to their tremendous "PUSH-POWER" at the blade.

These three **GALION GRADERS** also have what you now need — **GALION GRADE-O-MATIC DRIVES** (torque converters and power-shift transmissions). **EASY TO SHIFT**, much like the best automobiles, the shifting work is done for you. All you do is move the fingertip control levers. You can shift "**on the go**" in either direction. With the T-700 you have 3 speeds forward, 3 speeds reverse — with the T-600 and T-500 you have 4 speeds each direction — from creeper to high travel speed.

The old-type heavy duty **FOOT CLUTCH IS GONE**, together with its tiresome clutching and declutching. You get **FAST WORK CYCLES** because you can reverse smoothly and quickly, save time and energy on every operation.

WITH TORQUE CONVERTERS and .

THE LAST WORD IN GRADER PERFORMANCE AND VALUES. You'll never believe graders **can** do so much until you own one of these Galions and put it to work!

It's the "PUSH-POWER" at the Blade that counts!

- With these **TORQUE CONVERTER** and **POWER-SHIFT TRANSMISSION** combinations, the power is transmitted automatically in an infinite number of ratios. You get, in addition to effortless, automatic shifting, quick increases of torque multiplications to over 300% — automatically as needed. The torque converters also absorb the load shocks and prevent engine lugging or stalling.
- With this kind of smooth, shockless power transmission, effortless shifting, and balance of weight to horsepower, you get more work done easily than you ever thought possible.
- **HEAVY DUTY DIESEL ENGINES** are designed and matched to perform with torque converters and power-shift transmissions for maximum economy and efficiency for each size grader.
- **FOOT DECELERATORS** — for quickly reducing engine speeds and for increased ease of operation, permit immediate return to travel speed without changing the hand throttle.
- **TAIL SHAFT GOVERNORS** on the torque converters adjust the engine speed automatically to meet all loads or conditions — at any predetermined working or travel speed.

"PUSH-POWER" AT THE BLADE is the only power that counts in rating the efficiency and work production value of a motor grader.

ENGINEERED TO GIVE CORRECT BALANCE OF WEIGHT AND POWER. Graders with too much engine power and not enough grader weight spin their drive wheels, dig in, or side slip. High engine power, if not completely utilized, results in constant fuel waste and excessive tire wear.

POWER-SHIFT TRANSMISSIONS

Diesel engine, torque converter, power-shift transmission, and muffler are **STANDARD EQUIPMENT** on each model. Shiftable moldboard and 4-wheel brakes are standard equipment on Models T-600 and T-700.

GRADE-O-MATIC MOTOR GRADERS retain all the famous GALION features which also make for easy operation and increased production.

- Hydraulic booster steering.
- Extra-large positive traction tires — same size front and rear.
- Extra heavy and rugged front axle assembly.
- Extra sturdy box-type, single member frame; high-arched for maximum blade adjustments.
- Full visibility of work.
- Complete and effortless blade adjustments.
- Full hydraulic operation with fingertip controls.
- Comfortable platform and seat — with stand-up height weatherproof cabs available.

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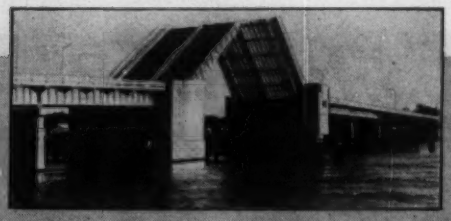

TALLER & COOPER helps keep toll traffic humming over Pascagoula's Singing River Bridge

Where the Mississippi State Highway spans the Pascagoula River, of legendary "singing" fame, Taller & Cooper Toll collection booths and equipment help keep traffic rolling smoothly and assure fast, dependable collection of revenue.

From coast to coast, over and under land and water, Taller & Cooper toll systems are in service at major bridge, turnpike and tunnel installations. For 25 years, Taller & Cooper has designed and manufactured toll equipment that offers the most modern and reliable operation.

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TOLL BOOTHS
TOLL COLLECTION SYSTEMS

Taller & Cooper Toll Collection Equipment is Used on Every Major Toll Facility in the U. S.

READER COMMENT

Training Good Draftsmen

SIR—In reply to the letter of Leo F. Caproni (ENR Oct. 6, p. 6), in which he calls for trained architectural draftsmen, we wish to call attention to the fact that the Hudson Valley Technical Institute in Troy, New York offers a two-year college program in both construction and highway technology.

These programs are designed to provide technicians for the building construction and the highway construction fields respectively. Other technical institutes offer similar training.

One of the chief contributions made to the building and construction industry by these programs is a supply of trained draftsmen including architectural, structural and topographical. We find that about half of our graduates will be interested and competent in drafting while the remainder will aim for work in other areas in the construction industry.

JOHN L. DE LEE
Head of Construction Technology
Hudson Valley Technical Institute
Troy, New York

Mining With a Fork Lift Truck

SIR—Your article on Swedish tunneling (ENR Sept 1, 1955) mentions and illustrates the use of fork-lift trucks for mounting platforms from which the rock scalers work. You may, therefore, also be interested to know that the same kind of truck, our Hyster model RT-150, is also being used to carry a drilling platform.

This is being done in Sweden's largest lead mine at Laisvall. Here, the Bolidens Mining Co. has replaced the lift forks which are standard on this elevator truck with a platform carrying four chain-fed drills. Although the platform loaded with drills weighs close to three tons, it is readily raised to any desired height along the lifting column—sufficient in top position to drill 30-ft benches. Elevating and lowering the platform

Engineering News-Record welcomes expression of opinion from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance.

Letters should be addressed: Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

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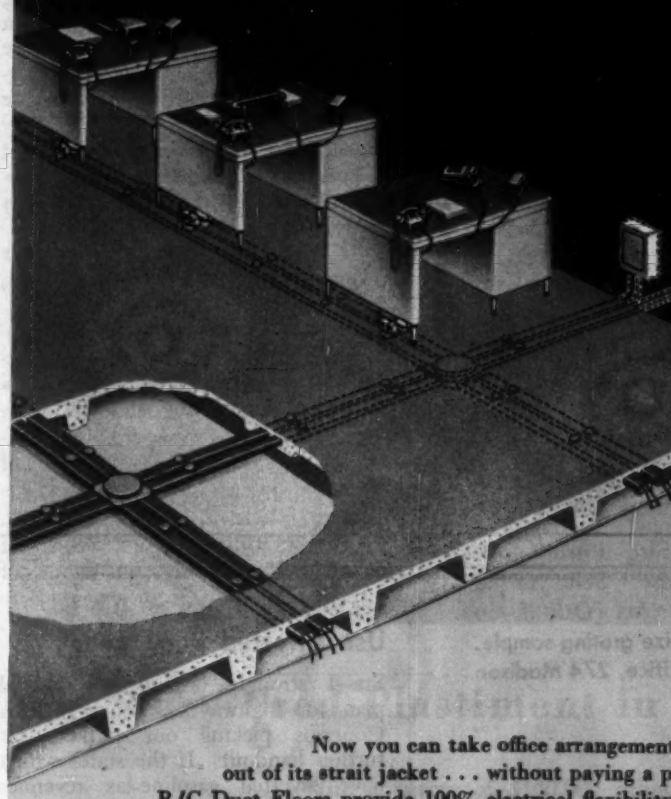

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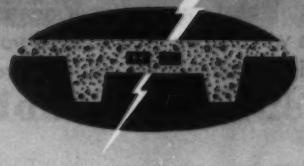

Now you can take office arrangement out of its strait jacket . . . without paying a premium! R/C Duct Floors provide 100% electrical flexibility to take care of any future rearrangements. Yet its original cost is about the same as a conventional wiring system of equal capacity. Outlets for power and communications systems can be connected to convenient risers in a matter of minutes. There is no ripping up or drilling through floors and ducts.

R/C Duct Floors consist of *standard* steel electrical distribution ducts set in the *structural* slab of reinforced concrete joist floors . . . *no expensive fill or topping is needed.* Meet all code requirements.

Average costs show that R/C Duct Floors cost 19% less than cellular steel floors! Before you design your next building, why not investigate R/C Duct Floors?

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Includes full details on design, costs, and technical specifications.

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Ohio State Office Building, Columbus, Ohio

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CUSTOM-MADE FOR YOUR JOB AND SAFE—IT'S Weldforged

READER COMMENT

can be accomplished from the platform itself. In the lead mine operation holes are drilled 16 ft deep to pull some 1,500 tons of ore each round.

LEW KRUMBEIN
Hyster Company
Portland, Ore.

Package Deals

SIR—The eulogistic references to the "package deal" method of erecting commercial buildings which appear in the article "Bringing Industry to the Suburbs" (ENR Oct. 13, p. 45), suggest that this very dubious procedure has your editorial approval. Certainly the absence of any critical comment gives a very one-sided picture of construction practice which has some very questionable features.

ROBERT F. LEGGET
Ottawa, Canada.

[EDITOR'S NOTE: No statements appearing in ENGINEERING NEWS-RECORD represent editorial opinion unless they are on the editorial page. The article in question, although staff-written, reflected the viewpoint of the company whose operations it described. There is, of course, as Mr. Legget points out, a large school of contrary opinion on the merits of "package deals."]

Use Diverted Road Funds

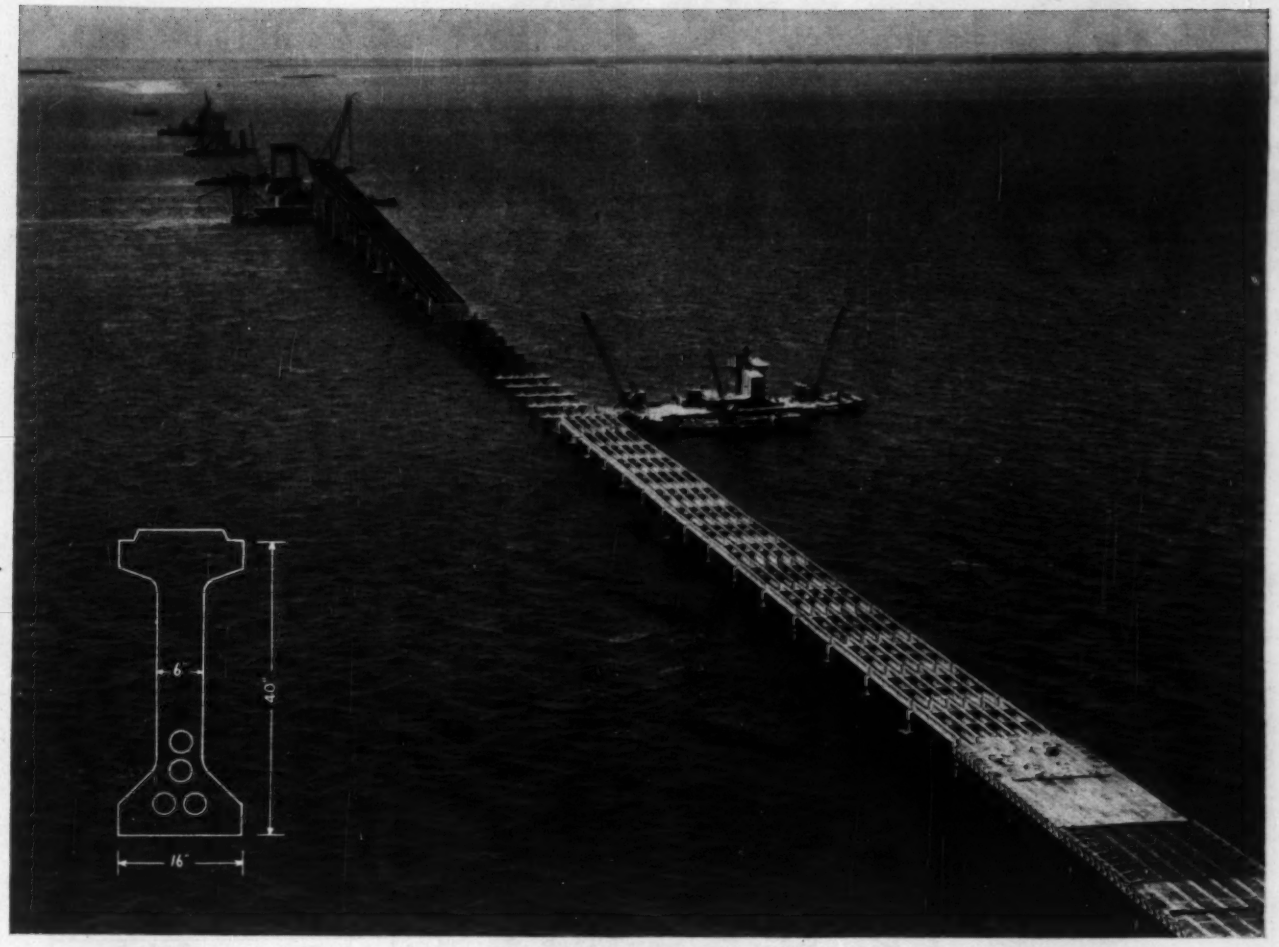
SIR—I strongly oppose any federal plan for highway construction with Congress picking our pockets for further handouts. If the states which have diverted gasoline-tax revenues these many years were shamed into using the money for roads (as originally promised) our roads would be greatly improved. Turnpike authorities in all states should be fostered to build a network of cross-country toll roads for which the user pays.

Get the federal government out of state business and responsibilities.

A. L. BONORDEN,
Plainfield, N. J.

CALENDAR

American Association of State Highway Officials, annual meeting, Jung Hotel, New Orleans, La., Dec. 4-9.
Nuclear Engineering and Science Congress, sponsored by the Engineers Joint Council, Public Auditorium, Cleveland, O., Dec. 12-16.
American Road Builders' Association, annual convention, Miami Beach Auditorium, Miami Beach, Fla., Jan. 11-14.
Highway Research Board, annual meeting, Sheraton-Park Hotel, Washington, D. C., Jan. 17-20.
American Society of Heating and Air-Conditioning Engineers, annual meeting, Sheraton-Gibson Hotel, Cincinnati, O., Jan. 23-25.
Associated Equipment Distributors, annual meeting, Conrad Hilton Hotel, Chicago, Ill., Jan. 29-Feb. 2.



Why They Used Plastiment in Florida's Sunshine Skyway

With a saving of $140,000 riding on the use of prestressed construction in this bridge over Tampa Bay, the engineers specified three principal concrete requirements for the 2178 post-tensioned girders involved: *Concrete compressive strength before tensioning steel — 4000 psi; Minimum compressive strength at 28 days — 5000 psi; and concrete had to be workable enough to permit uniform placement through the narrow section of each girder (see sketch).*

Plastiment Concrete Densifier's properties suited all 3 requirements. Plastiment's retarding action allowed more time for uniform depositing and compaction through the thin girder sections. And because, after final set, Plastiment-concrete consistently gains strength faster than ordinary concrete, Plastiment produced the desired post-tensioning strength at 3 to 5 days; with strengths as high as 7400 psi at 28 days.

For complete details on how Plastiment operates to produce uniformly high-quality concrete, send today for a copy of the illustrated booklet, "Plastiment Concrete Densifier." Our engineers will be glad to tell you how Plastiment can help you on your present job.

Owner: State Road Dept. of Florida, Tallahassee

Consulting Engineers: Parsons, Brinckerhoff, Hall & Macdonald, New York City

Concrete Contractor: Hardaway Contracting Co., Columbus, Ga.

Sika

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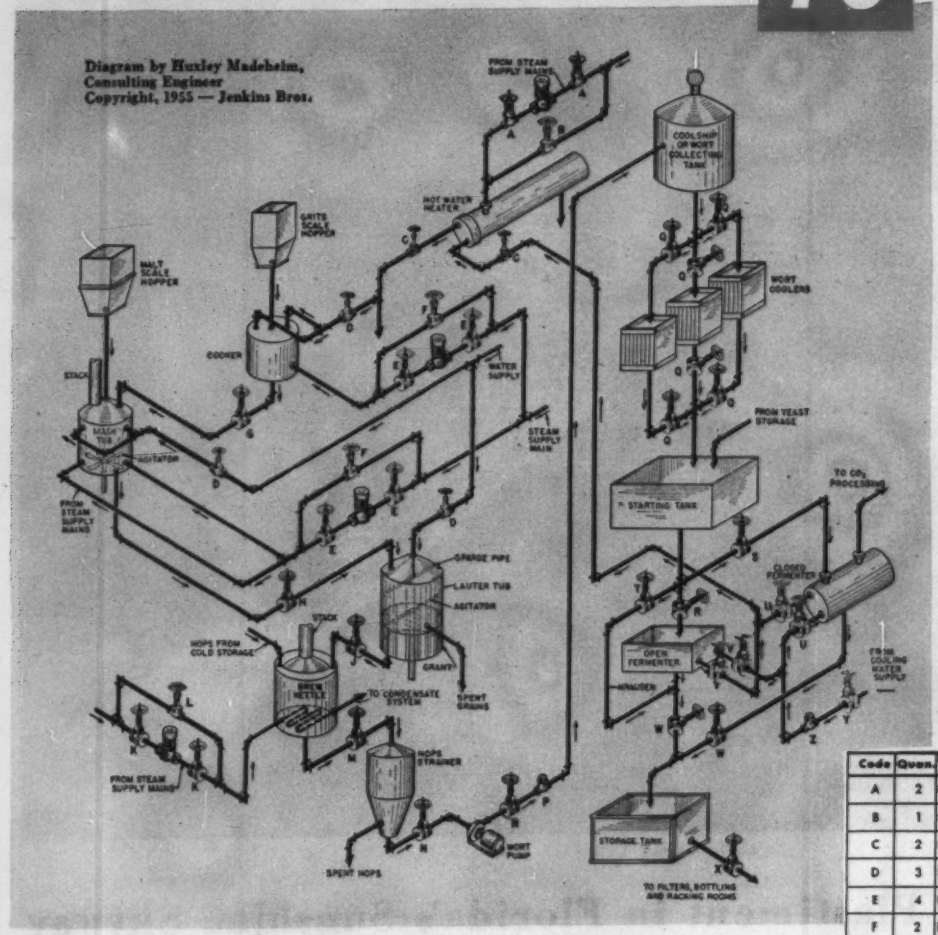
JENKINS PRACTICAL PIPING LAYOUTS 76



How to plan piping connections for a
GRAVITY-FEED MULTIPLE-STORY BREWERY

This piping layout is typical of installations in many breweries designed for gravity-feed processing, and the principal operations are briefly outlined.

Corn grits are cooked with water in the cooker, with enough added malt to convert and liquefy the grits. When the malt, which has been mixed with water in the mash tub, is properly steeped, the finished cook is dropped into it and the resulting mash thoroughly mixed.

Pumped into the Lauter tub, the mash grains settle to form a filter bed, from the bottom of which the clear liquid containing fermentable and unfermentable sugars is drawn. Extraction is increased by "sparging" with hot-water spray. This liquid, the "wort", flows by gravity to the brew kettle.

In the brew kettle, the wort is boiled with hops to add flavor and to clarify and preserve it. The hops are then strained off, and the liquid is pumped to the "coolship" tank to settle. It then goes through coolers to reclaim most of the residual heat, and on to the starting tank.

In the starting tank, the yeast is added, and the mixture flows to the fermenters, some of which are closed to collect the carbon dioxide gas for future use. After fermentation, the beer is cooled again and sent to storage tanks for eventual bottling and racking.

Consultation with accredited piping engineers and contractors, experienced in brewery design, is recommended when planning any phase of the various processing systems.

To simplify planning, select all the valves you need from the complete Jenkins line. It's your best assurance of *lowest cost in the long run.* Jenkins Bros., 100 Park Ave., New York 17.

Complete description and enlarged diagram of this layout free on request. Includes additional detailed information.

VALVE RECOMMENDATIONS
For details of valves to suit varying conditions see Jenkins Catalog.

Code	Quan.	Jenkins Valve	Service
A	2	Fig. 275 Bronze Gate	Shutoff steam to heater
B	1	Fig. 556-P Bronze Globe	Bypass to heater
C	2	Fig. 47 Bronze Gate	Shutoff water heater
D	3	Fig. 106-A Bronze Globe	Continuous water flow
E	4	Fig. 204 I.B. Gate	Process steam shutoff
F	2	Fig. 576-P Bronze Globe	Bypass water valve
G	1	Fig. 677-A Bronze Gate	Shutoff cooker mash
H	1	Fig. 677-A Bronze Gate	Shutoff finished mash
J	1	Fig. 677-A Bronze Gate	Shutoff wort to kettle
K	2	Fig. 204 I.B. Gate	Shutoff steam to kettle
L	1	Fig. 576-P Bronze Globe	Bypass to kettle
M	1	Fig. 677-A Bronze Gate	Shutoff wort line
N	2	Fig. 677-A Bronze Gate	Pump shutoff
P	1	Fig. 352 Bronze Swing Check	Prevent backflow
Q	6	Fig. 677-A Bronze Gate	Shutoff coolers
R	1	Fig. 677-A Bronze Gate	Shutoff open fermenter
S	1	Fig. 677-A Bronze Gate	Shutoff closed fermenter
T	2	Fig. 677-A Bronze Gate	Krausen line
U	2	Fig. 675-A Bronze Gate	Water to closed fermenter
V	2	Fig. 675-A Bronze Gate	Water to open fermenter
W	2	Fig. 677-A Bronze Gate	Shutoff storage
X	1	Fig. 677-A Bronze Gate	Shutoff rack & bottling
Y	1	Fig. 675-A Bronze Gate	Shutoff well water
Z	1	Fig. 352 Bronze Swing Check	Prevent backflow

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VALVES
Since 1864 TRADE JENKINS MARK
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ENGINEERING NEWS-RECORD

Vol. 155, No. 20 November 17, 1955

Number of copies printed this issue: 69,636

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THE CONSTRUCTION WEEK

NO CAUSE FOR ALARM—Though the need was obvious, the politics apparently wasn't as New York voters turned down a $750-million highway bond issue at last Tuesday's election. And, in neighboring New Jersey, for the same reason, a $100-million water supply project lost out (Page 21).

But, results of bond referendums elsewhere followed the normal pattern of recent years. Furthermore, bond authorities had this comforting word: On the average, only 48% of all bond issues are submitted at November elections.

NEW FRONTIERS—Private enterprise had two challenging goals set before it this week.

Idaho Power Co. awarded a contract to Morrison-Knudsen to start construction on the first of two dams that FPC has licensed it to build on the Hells Canyon reach of the Snake River on the Oregon-Idaho border (Page 25). As victor in one of the bitterest of the nation's public vs private power controversies, Idaho Power is on the spot to make good the boast that construction costs will be significantly below those for public projects.

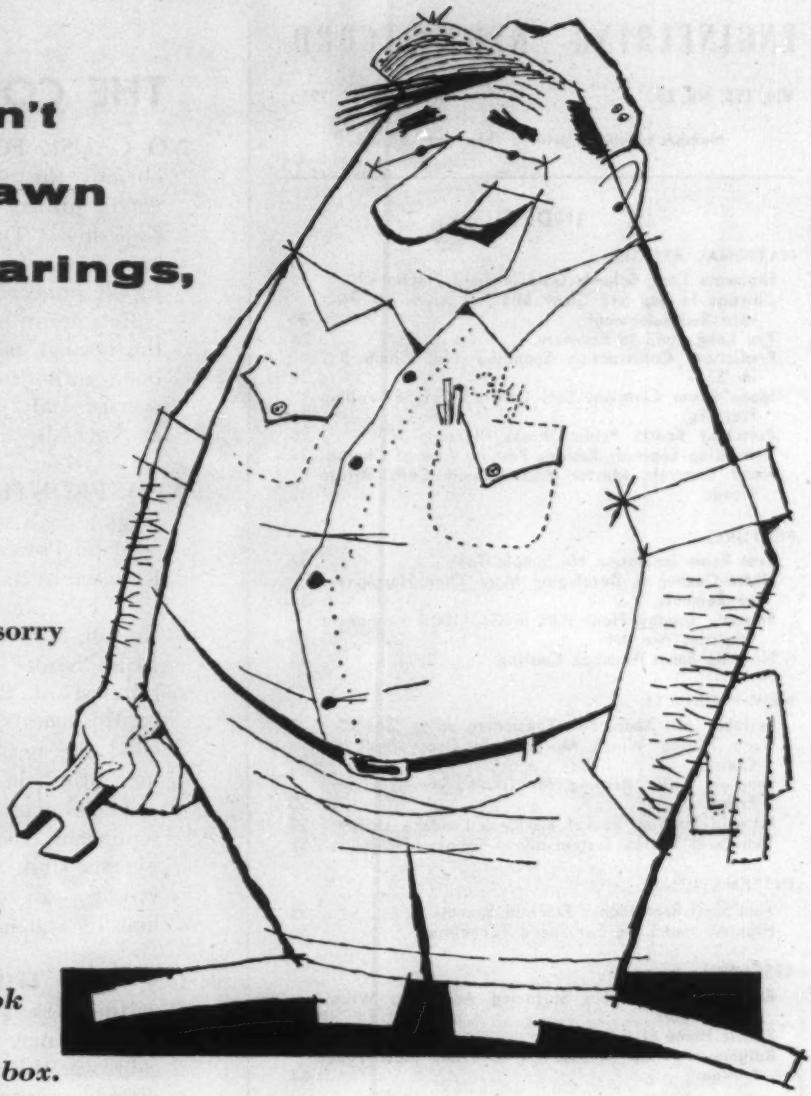
The Chicago Land Clearance Commission opened a significant vista for private enterprise by approving six slum clearance projects that will pave the way for an estimated $400-million investment in housing and industrial developments (Page 22).

ONWARD THE BOOM—Commerce and Labor Department statisticians see total construction spending hitting a new high of $44 billion in 1956 for a 5% gain over this year (Page 24). ENR had already predicted a continuing boom from another angle, with its preliminary forecast of a 5% gain in heavy construction contract awards in 1956 (ENR Oct. 20, p. 21).

ENR's forecast of a 15% gain next year for industrial contract awards and a 5% gain in commercial awards got solid backing last week from the McGraw-Hill Economics Department's preliminary survey of business spending plans for 1956 (Page 97). This indicates a 13% greater outlay for plant and equipment—capital spending of $33.4 billion in '56 compared to $29.5 billion this year.

UNIONIZATION OF ENGINEERS—Union efforts to organize members of the engineering profession will be intensified when labor's crusade to organize the unorganized gets under way following the AFL-CIO merger next month. These developments are in store: more emphasis on civil engineers; greater rivalry among competing unions; and a bigger wedge between trade unions and the independent union of Engineers and Scientists of America, which now disavows any thought of merging with the new federation (Page 103).

you can't talk brawn into bearings, boys!

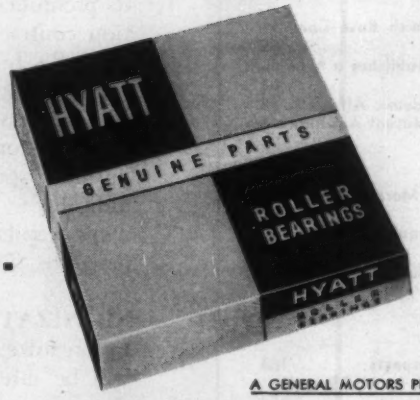


HY SAYS: Take it from an old-timer—a bearing's either *got* it, or it ain't. I fell for one o' those slick sales talks for off-beat bearings once myself—but *just once.* Was I sorry I hadn't used Hyatts!

Hyatts were so good they were original equipment when I broke into this game—*and they're even better today!* If you want to be proud of your work and keep your customers happy, just remember this:

There's other bearings that *look* as good, but you *hold out for Hyatts in the blue and yellow box.* When it comes to *quality,*

there's no substitute for...



meet HY WHEELER, the sage of the socket wrench!

He may have been tinkering with engines before you were engineering with TinkerToys, and he may be quaint, but he's a good man to know. He'll be here regularly from now on to give you a chuckle and some helpful hints. Watch for him!

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WASHINGTON OBSERVER

The Administration would like to see about 1,250,000 housing starts next year. And, if necessary, will re-arrange its credit policies to help home builders reach this goal. This public position, taken by Housing Chief Cole and other officials, is the Administration's answer to criticism from the industry that its policies are pushing starts below this level.

Criticism from the housing industry has been sharp—centering on tightening of money from the Home Loan Bank Board to savings and loan associations, FHA and VA tightening on terms of mortgages they'll insure, restraints on warehousing of mortgages by banks—touched up by declines in housing starts in recent months.

Big problem for the Administration is: How to keep starts up where they say they'll keep them—and do this without creating inflationary pressures both in housing and the economy in general. Administration credit policy right now is to be gently restrictive—to supply legitimate market demand for credit without adding to inflationary pressures.

Officials see no need for easing credit—right now, anyway—to meet their housing goal despite contrary views voiced by builders and savings and loans officials. They say the situation isn't as bad as complainers say, that demand for housing is so strong that it will get its share of credit—enough to build the 1,250,000 a year—in the present state of the money market.

If housing demand lets up, then they'll step in to ease terms to bring more buyers into the market. Officials say figures on housing starts are good—with no signs of a tailspin. They note that September and October starts, though down from the first half of the year, are still at the annual rate they are after.

•

The conflict of interest problem affects plans for financing of lease-purchase projects by General Services Administration.

Mansure and Strobel tried to name a group of advisers whom they could consult in setting up terms of the invitations to bid for construction and lease of the buildings.

With the Strobel case in the news, executives from industry refused to work on such a group.

Feeling was that such service would ban them from bidding on any of the projects. So GSA will have to go along as best it can, without the benefit of a procedure that has been found helpful by the Public Buildings Service in other matters—revising building standards, for instance.

•

Durkin's death won't change policies of the plumbers union. Durkin's assistant, Peter J. Schoemann has been running things during Durkin's illness; he's best bet to succeed to the presidency.

Durkin's last official act showed craft union caution on AFL-CIO merger. Durkin protested that the merger legalizes "dual unionism", permits two rival unions in a single field. He said that an industrial union could bargain for and get repair and construction rights in a plant, thus cutting out the craft union that did this work previously—and the new AFL-CIO constitution would bar them from attempting to take over.

•

Builders of trailers—"mobile homes"—boast new record output. Their trade association figures they'll sell more than 100,000 units this year, with a total sales figure of $435 million. Last year's output was 76,000 units.

Next year will be even bigger, officials say. One reason: New legislation that permits FHA mortgage insurance on trailer parks, which they say has been one of the big obstacles to sales. The regulations have just been issued by FHA.

At the Denver water dam one hose takes the place of many...

The immense water-supply dam just completed for the city of Denver, Colorado, required over 8,000 feet of air hose in its construction.

The experienced contractor who handled the job picked U. S. Royal Cord Air Hose for several hard-boiled reasons:

(1) U. S. Royal Cord Air Hose not only handles air—but also *water—and water under the extreme pressures required in washdown.* He used the hose on vibrators to consolidate the concrete—he used it as part of cooling lines on face of dam—on pneumatic tools, on sump pumps and sludge pumps, rock drills, chipping hammers, air wrenches.

(2) The contractor found there was no need to go easy on U. S. Royal Cord. *No* need for cribbing, no time wasted by workers in selecting or storing away special hose for special jobs. *No money tied up in stocking specialized hose.*

(3) Valuable pay hours saved—hour after hour, week after week. U. S. Royal Cord is *built like a tire*—that's why it can be kicked around and abused and made to do jobs you don't expect from an air hose.

You can save yourself plenty of worry by standardizing on "U. S." Hose. Performance after performance demonstrates the folly of wasting money on short-lived, cheap hose. You can get "U. S." Hose at any of the 27 "U. S." District Sales Offices.

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In Bond Elections Across the Nation . . .

Voters Passed . . .

- $150 million for Ohio institutions
- $74.8 million for Texas water supply
- $54 million for Hetch Hetchy power plants

Voters Rejected . . .

- $750 million for New York highways
- $100 million for New Jersey water supply
- Courthouses, parks and frills, in general

Highways Lose, Schools Gain

In future years, public works officials may remember Nov. 8, 1955 as the day voters said "no" to the biggest bond issue ever offered.

New York State voters decisively rejected a proposed $750-million bond issue for highways after internecine warfare between two major highway groups killed motorists' enthusiasm. Opponents of the measure, spearheaded by the Automobile Club of New York, Inc., conceded the need for an all-out roadbuilding program in the traffic-congested Empire State. But, they did not like the two-cent hike in the state gasoline tax that would have accompanied the bond issue and even more than that, they resented the fact that the proposed constitutional amendment did not include a guarantee that the $750 million would be spent only for roads, despite claims by the New York Good Roads Assn. that diversion was not an issue.

Some observers read in the election results a reluctance on the part of voters to approve anything that would boost taxes. But the answer did not appear that simple when the major defeats were analyzed.

Aside from the New York highway issue, the biggest news of the day was defeat of a $100-million water supply bond issue in New Jersey. As in the case of New York roads, the need was readily admitted. Then why was the proposal defeated?

The answer to that $100-million question seems to be that the whole water question in New Jersey has been trapped in political crossfire between a Republican-controlled legislature and Democratic Governor Robert B. Meyner.

Governor Meyner and his cabinet favored a reservoir development at Round Valley in Hunterdon County. When the legislature, after an independent survey, proposed the Chimney Rock project as less costly and more practical, the governor received the proposal cooly. And, the State Department of Conservation and Economic Development, which has the responsibility of developing water resources was openly critical of the Chimney Rock plan.

Now that the Chimney Rock plan has been soundly trounced, Meyner is expected to renew his drive for the Round Valley Reservoir. The legislature—still Republican dominated—may have other ideas. Republican leaders say they're waiting for a second engineering report, due Dec. 15. Sometime in '56, New Jersey voters may go to the polls to tackle the water problem again.

Not all of the big issues lost. Ohio voters, for example, approved a $150-million program that gives $75 million to state-operated colleges and universities and state office buildings, and earmarks another $75 million for mental, penal, welfare and correctional institutions.

The state legislature must approve each specific project in the program. But, with the financing assured, this is not expected to result in any lengthy delays. Some construction may get under way by the end of next year.

Ohio voters apparently gave their approval to the $150-million bond issue on the basis of three well-publicized points:

- All state institutions are seriously overcrowded.
- Enrollment in the five state-owned universities continues to mount.
- The state is now forced to rent office buildings throughout the state to house governmental units.

Schools fare well—Bond issues for schools generally met a favorable reception. Fairfax County, Va. voters said "yes" to one of the biggest—$22 million. A school district in Lakewood, Colo. voted $7.7 million. Cleveland Heights, Ohio, approved $5 million for schools and Springfield, Ohio, $5.2 million, the largest of a number of successful school building referendums in the state.

Water supply—While the New Jersey water supply bond issue made headlines going down to defeat, some other major water supply projects passed easily. The Canadian Municipal Water Authority (Planview, Tex.) won approval for its proposed Canadian River dam project when nine west Texas cities supported a $74.8-million bond issue.

And, voters in the City and County of San Francisco voted to spend $54 million for additional power plants at the Hetch Hetchy project.

Little Rock, Ark., approved a hike in water rates to pay for a reservoir, dam and filtration plant, carrying a total price tag of $10 million.

In New York State, however, voters turned down the highly-controversial and long-proposed Panther Dam project after conservationists conducted an intensive campaign, against it.

Bond issues for sewage treatment plants and related facilities had a mixed reception at the polls. For example: Mansfield, Ohio, voted $2.8 million for sewers but Zanesville, Ohio, turned down a $2-million sewage treatment plant. Many of the smaller projects (less than $1 million) apparently passed without trouble.

Courthouses, government office buildings and some park improvement programs ran into snags in the polling booths. As one bond authority summed it up: "Anything that looked urgent, such as schools, passed in this election. But anything that was considered a frill by the voters—or anything that could be deferred without real danger was turned down."

Urban Renewal

Chicago to buy and clear vacant and blighted areas for private redevelopment

Six Chicago slum clearance projects, involving an expenditure of $48 million, are slated to be started in 1956. Some of the projects will require several years to complete.

The new program is expected to result eventually in an investment of private money of more than $400 million in new housing and industrial plants that will be built on slum and tax-delinquent sites made available for redevelopment by the Chicago Land Clearance Commission.

The six projects scheduled to be started next year include:

- A new industrial area of 45 acres, bounded by Polk St., Canal St., Roosevelt Rd., and the south superhighway route.
- A near West Side industrial conservation project of 132 acres, with an estimated 79 acres of the project to be cleared of old buildings.
- A 27-acre clearance at 29th St. and Michigan Ave. to make way for row housing and apartment buildings.
- Clearance of 40 acres of slums on the near West Side for new homes and apartments. In conjunction with this, existing residential buildings in the area that are still considered structurally sound will be rehabilitated.
- Acquisition and resale by the Land Clearance Commission of 200 acres of tax-delinquent lands on the far South Side to be developed with single-family homes.
- A $25-million plan to transform a 30-acre blight tract on the near North Side. This phase of the program, sponsored by the Greater North Michigan Avenue Assn., calls for redevelopment with modern apartments and stores.

The six projects would require $32 million in federal money, and $16 million in city and state funds.

These projects are in addition to six major projects undertaken since the Land Clearance Commission was created in 1948.

FHA Certifies Eight Cities For New Mortgage Insurance

With certification of the first programs in eight cities last week, the government started the wheels rolling on special FHA mortgage insurance for builders and investors who provide dwellings to rehouse families displaced by urban renewal.

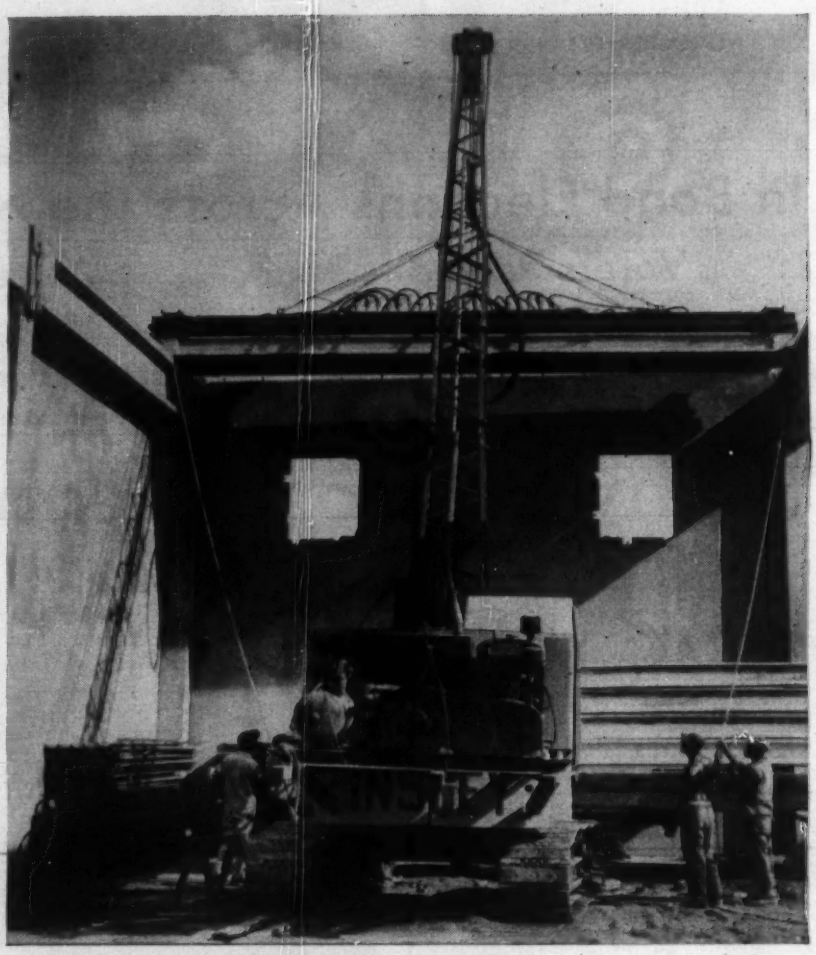
In these initial programs, the liberal mortgage terms will apply to about 1,400 dwellings. Administrator Albert Cole of the Housing and Home Finance Agency expects the special financing aids to be more widely used soon, as needs for this type of housing are certified in other cities.

Authorized by Section 221 of the 1954 Housing Act, the insurance is intended to relieve the pressure on public housing for families that are contained in the upper range of the low income group.

Section 221 mortgages are free of the credit restraints imposed last summer on other FHA-insured mortgages. More important, the Federal National Mortgage Assn. (Fanny Mae) can make advance commitments to buy the mortgages, thus assuring lenders of a ready market for the paper.

The mortgages may be used to finance either new or existing housing, both single family and the multi-family. To serve the price range intended, the mortgage amount is limited to $7,600 per dwelling, or $8,600 in high-cost areas.

To buy this housing, families displaced by urban renewal programs would have to make downpayments as low as 5%, with maturities up to 30 years.



Concrete Roof Panels Float on Air

With vacuum-lift providing a cushion, 682 precast, prestressed concrete roof panels literally floated into place without a crack to cover a 100,000 sq-ft plant for Chambers Gas Range Co. at Oxford, Miss. After grade beams, girders and tilt-up walls were precast, prestressed and erected, and columns and floor cast in place, a 25-ton truck-crane placed the 5x30-ft roof panels. McDaniel Bros. Construction Co. of Jonesboro, Ark. is general contractor for the industrial plant.

More Power for Oregon

Portland (Ore.) General Electric Co. has applied to the Federal Power Commission for a license to build a $13-million dam and powerhouse at the North Fork site of the Clackamas River. The concrete arch dam and the 53,000-kw power plant is a phase of a river system program designed to add 100,000 kw to PGE's Clackamas facility. Future plans call for revision of PGE's Faraday plant to add another 25,000 kw to the north Clackamas site.

The Long Road to Recovery

Connecticut faces new two-year tax for flood aid, while North Carolina takes steps to deal with future hurricanes

Strategic plans for flood recovery and for minimizing hurricane damage took the spotlight in two disaster-stricken states last week.

At an emergency session of the Connecticut legislature, Gov. Abraham A. Ribicoff proposed a two-year, 10% increase in state taxes to pay for a $31.4-million flood recovery program. And in North Carolina, Gov. Luther H. Hodges launched a long-range project designed to protect the state's coastal areas from heavy damage during future hurricanes.

Disaster problems in these two states are big. In Connecticut, damages from the August flood came to an estimated $202 million, and October's high waters added another $28-million loss. This $230-million total amounts to more than a year's income from the entire state tax take. In North Carolina, damage from Hurricanes Hazel, Connie, Diane and Ione is estimated at $292.6 million.

Connecticut's Flood Recovery Committee already has come up with a number of recommendations for spending flood relief money. But it left the problem of finance up to Gov. Ribicoff. He has made his recommendations—but the success of the program will depend on bi-partisan support in the General Assembly, because the House has a Republican majority while Democrats control the Senate. And in the recent regular session, party difference blocked a good part of the governor's program.

Financing could also shape up as a formidable problem in North Carolina's hurricane program. The project will be costly. It is expected that local and federal governments will have to share expenses with the state in order to carry out the work.

• Connecticut

The Connecticut recovery plan calls for all state taxes, except the gasoline levy, to be raised by 10% for a two-year period. Under the measure the sales tax would jump from 3% to 3.3% and the cigarette tax from 3 to 4 cents.

The proposed tax program is calculated to bring in $30 million. In addition, the federal government is being relied upon to contribute an additional $3 million to the state's flood relief fund. This would be almost enough to meet the costs involved in flood recovery proposals drafted by the State Flood Recovery Committee.

The committee has recommended a $35.2-million program for flood repair and rehabilitation, it also suggested an $11.7-million long-range planning and improvement program for towns—but this will hinge on the willingness of these towns to participate on a sharing basis with state and federal agencies.

These are among the recommendations made by the Flood Recovery Committee:

- $2.2-million aid to flood victims. This includes $2.1 million for abatement on local taxes for property that is damaged 50% or more.
- $16.6-million aid to towns. This includes $14.5 million for repair and reconstruction of local highways and bridges; $1.5 million for tax losses; $600,000 for payment of damages to schools and other municipal property.
- $15.5 million for replacing and repairing state highways and bridges. Another $600,000 would reimburse state agencies and the governor's emergency fund for restoring damaged property and for carrying out emergency flood operations.

The committee also made four major suggestions for redevelopment planning. They are: authorize towns to declare a six-month moratorium for rebuilding in flooded areas; empower local redevelopment agencies to acquire land for the relocation of shopping and industrial centers; limit building in flood-prone areas; assist towns in the financing of redevelopment projects.

• North Carolina

North Carolina already has started the ball rolling on its program to mitigate potential damages caused by future hurricanes.

A staff of experts has been retained to carry out preliminary studies. To insure coordination and provide advice, Gov. Hodges has appointed three hurricane planning groups. These are composed of representatives of several state agencies and an advisory committee of private citizens from eastern North Carolina, which bore the brunt of this year's hurricanes.

The researchers' first step will be to assess past damages and to make specific recommendations for the future. To do this, they'll try to list and evaluate all methods used by other states and the federal government to reduce hurricane damage.

State officials already have come up with some suggestions for the planning groups' consideration. They include:

- Build a system of groins and jetties along the state's entire beach front to protect and stabilize the Outer Banks.
- Construct levees and dikes along critical rivers and waterways.
- Work continuously to keep ditches and canals open.
- Develop sand dunes, starting with man-made ones 30 ft wide at the base and 4 to 5 ft high.
- Enact laws making it illegal to alter sand dunes on the ocean front, or to divest the dunes of their vegetation.
- Construct dikes for the protection of coastal farm lands and for improving agricultural drainage systems.
- Consider new building standards that are appropriate for structures erected in hurricane areas.
- Revise building codes to require ocean-front buildings to be set back a certain distance from the high water mark. Code revisions should also call for beach buildings to be erected on suitable pilings.
- Encourage private owners to build masonry seawalls.
- Provide the State Department of Conservation and Development with funds for continuous study of beach erosion and the stabilization and control of sand dunes.

Meanwhile, action has been taken on another front to deal with hurricane damage. The North Carolina Highway Commission has authorized a complete two-way radio communications system for four highway divisions. These divisions are in the hard-hit coastal section of the state, but if the pilot system proves satisfactory, similar facilities may be set up in all 14 highway divisions.

The new $76,000 radio system will be in constant touch with Highway Department headquarters in Raleigh. It is expected to minimize road damages by speeding protective work in critical areas.

Long-Range Viewpoint

Mississippi needs a minimum of $922.5 million to improve its roads to meet traffic increases expected during the next 10 years. T. C. Robbins, director of Mississippi's Highway Department, reports that if funds were available some 900 mi could be added to the state-maintained highway system and 55,000 mi of streets and roads could receive needed repairs.

Government agencies predict . . .

Construction Spending Will Climb 5% in '56

Construction put-in-place will reach a new peak next year, 5% above this year's record level. That's the bullish forecast made last week by the Commerce and Labor Departments in their annual outlook.

Government economists and statisticians expect construction expenditures to climb to $44 billion, about $2 billion above their latest adjusted figure for 1955.

In making this forecast, government experts assumed that there will be at least a moderate increase in overall economic activity and that there will be adequate investment funds to finance the construction work.

The government figures also assume that construction costs will rise only moderately, with increased production of materials offsetting the threat of any major shortages.

The big rise next year is expected to come in public works. The Commerce Department-BLS prediction is that spending for public works will jump 10% to reach a 1956 total of more than $13 billion.

Private construction is slated for a more modest increase, according to the government. The outlook is for a boost of 3% over this year, running the 1956 total up to nearly $31 billion.

• **Fewer housing starts**—An estimated decline in new housing is largely responsible for the small rise in private construction. Housing starts next year probably will add up to 1,200,000 units, as against 1,300,000 for this year.

Spending in nearly all other areas of private construction is expected to go up in 1956. One major exception is construction by utilities, which should be on a par with this year.

Industrial, commercial and religious construction will rise sharply, according to the government outlook. These three categories will account for an increase of nearly $1 billion over the current year.

• **Highways to set record**—Public works will turn up large increases in a number of categories. Star performer is expected to be highways. Government estimates indicate that spending for roadbuilding will jump $500 million and will reach an all-time high of $4.6 billion.

Substantial increases are estimated also for schools, sewer and waterworks and for military facilities.

Another sharp rise in construction expenditures is charted for state and local public works. This estimate moves up to $500 million for 1956. The St. Lawrence power project and related facilities account for a good share of this increase.

Spending prospects for public housing and conservation and development—mainly flood control, navigation and reclamation projects—show the first rise in several years.

A big block of the estimated construction spending for next year represents continuing work on projects that are already under way. (This differs from ENR's forecast of Oct. 20, 1955, p. 21, which was based on awards that have not yet been made.)

Part of the government estimate is based on reported construction plans, bid invitations and contract awards.

The Commerce and Labor Department experts checked their outlook for next year against the trend of work in recent weeks. And, they figured each category of construction separately in coming up with their overall estimate of a 5% increase in construction spending for 1956.

New Construction: Up 5% Next Year

Type of Construction	1955	1956	% Change
	(In Millions)		
PRIVATE			
Residential (excluding farm)			
New dwelling units	$14,765	$14,300	− 3
Additions and alterations	1,250	1,500	+20
Nonhousekeeping	330	400	+21
	$16,345	**$16,200**	− 1
Nonresidential building			
Industrial	$2,400	$2,800	+17
Warehouses, office and lofts	1,125	1,225	+ 9
Stores, restaurants and garages	1,920	2,250	+17
Religious	740	850	+15
Educational	500	525	+ 5
Hospital and institutional	350	350	0
Social and recreational	245	275	+12
Miscellaneous	350	425	+21
	$7,630	**$8,700**	+14
Farm construction	**$1,400**	**$1,350**	− 4
Public utility			
Railroad	$340	$400	+18
Telephone and telegraph	700	775	+11
Local transit	25	25	0
Pipeline	325	350	+ 8
Electric light and power	1,800	1,700	− 6
Gas	1,275	1,200	− 6
	$4,465	**$4,450**	a
All other private	**$160**	**$150**	− 6
TOTAL PRIVATE CONSTRUCTION	**$30,000**	**$30,850**	3
PUBLIC			
Residential	**$250**	**$275**	+10
Nonresidential Building			
Industrial	$705	$475	−33
Educational	2,450	2,700	+10
Hospital and institutional	330	275	−17
Other nonresidential building	735	775	+ 5
	$4,220	**$4,225**	a
Military facilities	**$320**	**$1,500**	+14
Highway	**4,100**	**4,600**	+12
Sewer and water	**1,080**	**1,200**	+11
Public service enterprises	**280**	**500**	+79
Conservation and development	**600**	**675**	+13
All other public	**150**	**175**	+17
TOTAL PUBLIC CONSTRUCTION	**$12,000**	**$13,150**	+10
TOTAL NEW CONSTRUCTION	**$42,000**	**$44,000**	+ 5

a—Change of less than one-half of one percent

Snake River Dams

Idaho Power Company lets contract for $87-million Oxbow, Brownlee projects

Idaho Power Co. last week awarded a contract to Morrison-Knudson Co., of Boise, Idaho, for construction of the $87-million Brownlee and Oxbow hydroelectric projects in the Hells Canyon reach of the Snake River, along the rugged Oregon-Idaho border.

The decision to award the contract and start work immediately was made despite continued opposition to private development of the projects. Public power advocates of a single, high, federally-built dam at Hells Canyon have served notice they will go to court this month in an attempt to overturn the Federal Power Commission license that permits three low, privately-built dams.

Development by Idaho Power Co. faces opposition not only in the courts but also in Congress, where some senators have threatened to cancel the FPC license to Idaho Power by legislative action restricting development of the Hells Canyon site to federal agencies.

The Brownlee project will be started first, according to Idaho Power, in conformance with the schedule set up by the FPC. The license requires completion of Brownlee in three years, and completion of Oxbow two years after it is started.

• **Low costs predicted**—Both dams will be completed at costs below the estimates previously given both by the company and the contractor at FPC and Congressional hearings, according to T. E. Roach, president of Idaho Power.

His view was supported by H. W. Morrison, president of Morrison-Knudsen, who said, "We are confident the dams will be built at the lowest cost per kilowatt of any post-war hydroelectric power plants in the country."

Both Brownlee and Oxbow will be impervious core, rockfill dams.

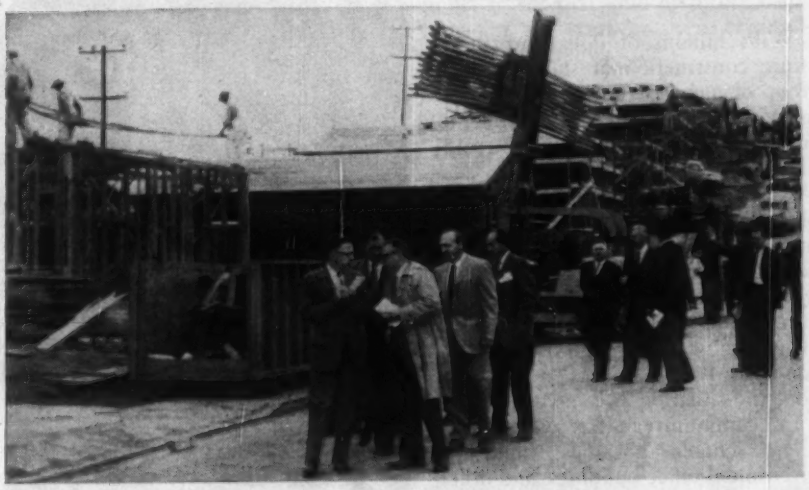
Brownlee, located 8 mi north of Robinette, Ore., will be one of the 15 highest dams in the world. The $63-million dam will be 395 ft high and 1,320 ft long. Its reservoir will be 57 mi long with 1,500,000 acre-ft of flood-control storage space. Power plant capacity at Brownlee will be 360,000 kw initially. This later can be increased by 50%.

The $24-million Oxbow development will be 12 mi downstream from Brownlee, near the town of Homestead, Ore. This dam will by 205 ft high and 725 ft long. Its reservoir will extend upstream 12 mi to the tailwater of the Brownlee plant. Oxbow's initial 151,000 kw capacity can be increased 50% later by addition of two more generating units.

• **Start immediately**—With a big "rush" marked on the two projects, Roach said work will start immediately.

"The contractor and the company will begin moving men, material and machinery into the project area as rapidly as possible to establish a work camp, to build access roads and to get under way on the dam sites themselves," Roach stated.

B. W. Williams, vice-president in charge of dam and hydroelectric plant construction, will be in charge of the work for Morrison-Knudsen. Glenn Johnson, named as field project manager, was in charge of M-K's construction of the C. J. Strike Dam for Idaho Power in 1952. The utility's construction chief will be E. A. Woodhead, chief consulting engineer for the company.



American Homebuilding Scores . . .

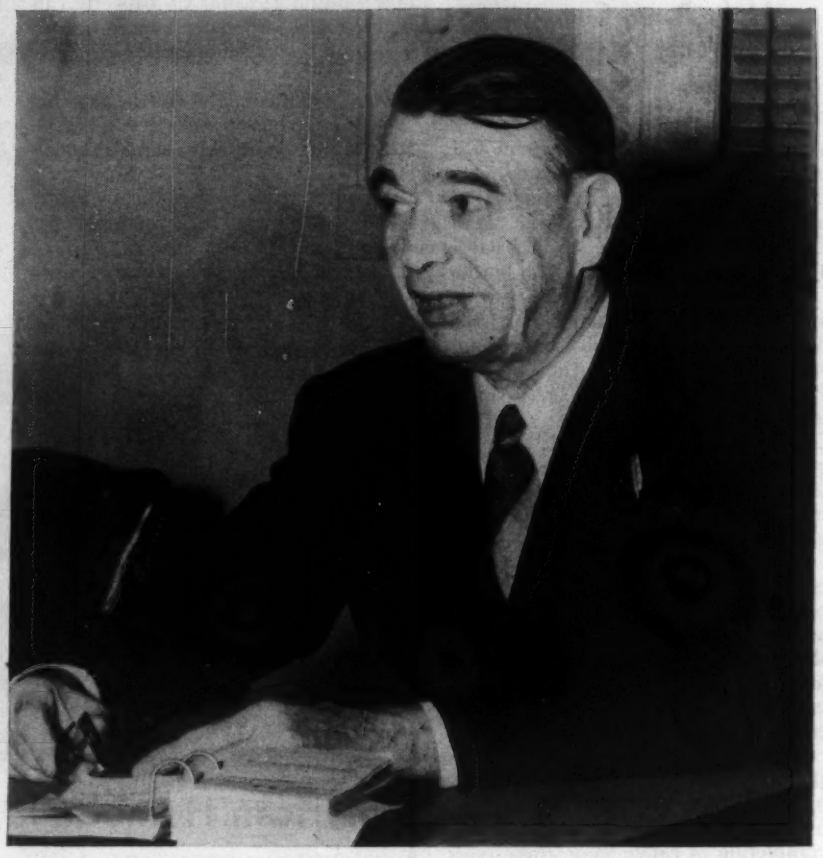
. . . By Ringing Up a Russian Sale

Visiting Russian housing experts, on a month-long U. S. tour (ENR Nov. 10, p. 22) were obviously impressed by mass production techniques used by American homebuilders, such as Oddstad Homes, San Bruno, Calif. The Soviet observers watched in rapt attention as fork lift trucks placed trusses on top of the stud walls, ready for workmen to nail them in place.

The Russians offered ready proof that they wanted to learn from their American counterparts—they bought (for $8,000) an Oddstad home identical with the one shown here, for shipment to Russia where it will be exhibited in a Moscow trade fair. The two-story house, designed for a hillside site, has three bedrooms, two baths, living-dining room and kitchen on the upper floor and a full basement and two-car garage on the lower level.

President Boosts Public Works Planning

Maj. Gen. John S. Bragdon, former Deputy Chief of Engineers, buckles down to the job of coordinating all state, local and federal long-range public works planning, while he urges 110,000 construction agencies to polish up their crystal ball.



With billions of dollars worth of future construction at stake, a small group of men last week were at work in Washington on a new solution to an old problem—public works planning.

A lack of long-range public works planning has been evident since the turn of the century, but its seriousness was never appreciated. Later, when the federal government rushed into public works construction on a mammoth scale through the depression-born Public Works Administration, the situation became acute.

In community after community, where schools, hospitals, highways, government office buildings, and other public works were to be built, officials found they had inadequate plans—or no plans at all. Finally, with the complex, constantly-changing conditions of World War II and the postwar period, the need for sound, long-range public works planning became more imperative daily.

Against this background, President Eisenhower—three months ago—acted on an earlier Congressional recommendation that may start a major segment of the construction industry on a better-organized, more efficient and more stabilized future. On August 12, he put White House prestige behind public works planning when he elevated Maj. Gen. John S. Bragdon (Ret.) to the post of special assistant to the President—"to serve as coordinator of public works planning."

The President handed a challenging task to his one-time West Point classmate. He asked Bragdon to:

- Dig out, compile and analyze the elusive facts and figures on new public facilities necessary to service and sustain an expanding economy.
- Measure and report the long-range planning of all governmental agencies—state, local and federal—for building the needed public works
- Determine what could be done through public works construction to counter a business decline.

Hand in glove with these requests was an implied commission to stimulate long-range planning for all categories of public construction. In short, Bragdon's assignment was to find out what public works were needed to adequately serve an ever-growing population; to find out what various public agencies intended to build to meet future needs; and, to encourage states, cities, counties, and the federal government to plug up the planning gaps.

Without such advance planning, these agencies would have no assurance that they were spending their public works money wisely and there would be little chance of speeding-up construction of worthwhile projects when this became desirable.

Eisenhower had clear-cut Congressional backing in establishing the new White House post. Last year, the Joint Committee on the Economic Report called for a coordinator of public works planning, directly responsible to the President. And, in this year's committee report, the Congressional group urged the President to create the post as soon as possible.

• Some agencies object—To the public, the creation of the new public works post seemed to be blessed with harmony. Backstage, the scene was different. From the start, government agencies concerned with construction have been opposed to the idea of a coordinator for federal public works planning.

Officials in charge of waterway, flood control, reclamation, highways, housing, conservation and budgeting activities privately criticized the proposal as an unnecessary duplication of planning and programming services that were giving satisfactory results.

These federal construction agencies foresee the possibility that the coordinator's office some day may grow into a board of review for federal projects, along the lines recommended by the two Hoover Commissions and the Kestnbaum Commission on Intergovernmental Relations.

The President gave Bragdon authority necessary to do his job. In the federal area, this authority carries real power. Bragdon may call on government agencies for assistance and may form an advisory committee on public works. (This committee already has been formed and has held its first meeting.)

But on the state and local front, the President's directive to Bragdon bestows prestige—without power. This is

one of the most challenging aspects of the job. Both in volume and diversity, public works programs of state and local units outrank activities of the federal government. Altogether, there are nearly 110,000 governmental agencies that have some kind of public works responsibility. The overwhelming majority of these are in the state and local field. Lacking the authority he has in the federal field, cooperation is Bragdon's only avenue to success in state and local planning.

• **Uses national organizations**—To set up effective liaison with the many state and local units that are responsible for public works construction, Bragdon's office is working with national organizations.

In the future, Bragdon also hopes to interest outside organizations in undertaking research projects on major public works problems. Typical problem: What is the role of public works in the overall economy?

For his part, Bragdon brings a wealth of construction background to the planning problem. As former Deputy Chief of Engineers, he was in charge of the big military construction program during World War II. In his new post, he is compelled to utilize outside organizations because his staff has neither the manpower nor the resources to carry on large undertakings. (He now has seven men, hopes to add three more to round out the organization, which is divided into three sections—federal, state and local, and research.)

Nucleus of the staff came from the small unit that Bragdon had headed since the spring of 1954 as coordinator of public works planning for the Council of Economic Advisers. From that earlier group, he has retained his executive assistant, Col. John A. Meek, a Corps of Engineers officer with extensive experience in planning and programming, and George Deming, an expert on municipal finance.

To date, Bragdon has filled out his federal section with three men, headed by Floyd D. Peterson, an engineering expert on water resources, formerly chief of civil works in the Bureau of the Budget. Working with him are Robert B. Foster, who came from Army logistics, and Cmdr. Edwin Gibson, who is now on loan from the Navy's Bureau of Yards and Docks.

More time is needed to round out the staffs of the state and local, and research sections. In addition to Deming, Bragdon has brought Henry Osborne, experienced civic planner and former traffic engineer of Buffalo, N. Y., into the state and local unit.

The research section consists of James S. Taylor, an economist with government and private experience.

All federal agencies and a number of cities and states now program their planning six years ahead. Bragdon hopes to see that kind of future planning—for six years or even twenty—adopted generally.

Strobel Resigns Public Buildings Post

Caught in a crossfire of charges, Peter A. Strobel, New York consulting engineer, resigned last week from his post as Commissioner of Public Buildings. Public hearings, at which it was alleged that Strobel's government service involved a conflict of interest with his consulting firm, Strobel & Salzman, led to the resignation.

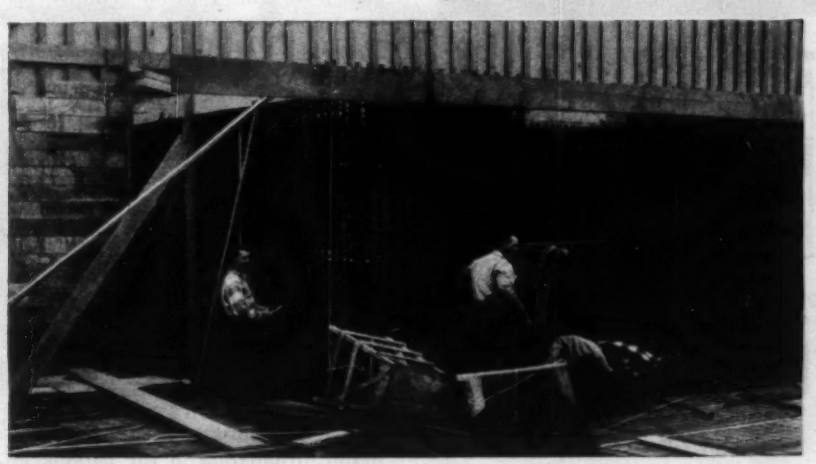
Strobel made it clear that he resigned to save the Eisenhower Administration from embarrassment, but denied any impropriety in his conduct or business associations.

In a letter to his chief, Edmund F. Mansure, administrator of the General Services Administration, Strobel said: "No matter how honorable my conduct and no matter how innocent my intentions, the mere existence of my private business connections will be seized upon by some people to create suspicion and embarrass me and the Administration."

Mansure accepted the resignation with regret and praised Strobel for his high professional competence and experience. He also commented that Strobel had "contributed immeasurably to the Lease-Purchase program."

Strobel last month became a target of continuing Democratic efforts to uncover conflict of interest cases involving businessmen in government. He was called up before a House Judiciary Subcommittee headed by Rep. Emanuel Cellar (D-N.Y.) who commented that Strobel had used "very poor judgment" in continuing his interest in Strobel & Salzman.

In his letter to Mansure, Strobel summarized what he had told the committee: That it was understood when he came to Washington that he would retain his financial interest in Strobel & Salzman and that there never had been any secrecy or evasion regarding his business connections.



Heavy Construction Protects Bank From Light Fingers

Open-web joists are being used to reinforce 18-in.-thick walls of a vault in a building being constructed for the National Trust Co. in Vancouver, B. C. The vault is 12x20 ft by 8 ft 6 in. high. To meet requirements of the Canadian Underwriters Assn., reinforcing cannot be spaced more than 2½ in. c-c and must have a minimum weight of 27 psf. The economical solution proposed by Dominion Bridge Co. calls for 10-in. modified DB Short-Span Joists set vertically in the walls and tied with horizontal ⅜-in. bars in c-c. Alternate joists have 3 in. and 5 in. of concrete cover. McCarter, Nairne & Partners are the architects-engineers. Armstrong & Monteith Construction Co., Ltd. is the general contractor for the Vancouver bank project.

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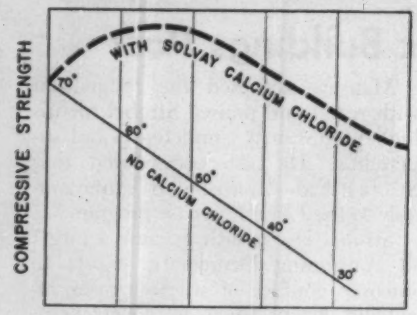
CALCIUM CHLORIDE KEEPS CONCRETE STRENGTH from DROPPING with the TEMPERATURE



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Park-Ride Lot Opens, Others May Follow

The first peripheral parking-area to be combined with express bus service to mid-town New York City as part of a major N. J.-N. Y. vehicular crossing is expected to offer one solution to the serious problem of New York congestion.

The Port of New York Authority, which built the "park-ride" lot, and the Public Service Coordinated Transport Co., of Newark, N. J., which will operate it, are so sure of its success that they are already predicting several similar projects in the future aimed at relieving much of the congestion in river-crossing structures and mid-town streets.

The 1,100-car lot, located in meadowlands of North Bergen, N. J., is adjacent to the main viaduct approach to the Lincoln Tunnel just two miles from the western portal of the tube. The PNYA bus terminal, near the eastern end of the tunnel is a 15-minute run for the express buses that will be dispatched every five minutes during rush hours and every 15 minutes during other periods throughout the day.

The 10-acre lot, built by the authority for $500,000, presented several construction problems that arose because of its location, its elevation and poor soil condition.

The parking lot is bisected by the approach viaduct. After completion of the third tube of the Lincoln Tunnel the viaduct will be altered to provide two additional lanes for traffic. Before installation of the parking lot, foundations for the piers of the additional viaduct structure had to be completed.

After necessary piles had been driven and foundations were in place, the entire area had to be filled to an elevation of 306 ft from the natural swampy level of 300. This required the expense of purchase and placement of more than 90,000 cu yd of fill material. James Mitchell, Inc. of Jersey City, N. J. was general contractor.

In emphasizing the part that the new parking lot can play in reducing traffic into the tunnel, Donald V. Lowe, chairman of the PNYA, pointed out that the capacity of the tunnel at present is about 4,200 vehicles one way during peak hours from 7-9 a.m. If 1,100 of these cars use the new facility, their occupants could be carried in only 24 buses and demand on tunnel's capacity could be reduced by 25%, or 400 to 500 cars per hour. With completion of the third tube, he continued, peak-hour capacity of the whole tunnel could be increased by one half.

Sanitation Group to Study Ohio River Radioactivity

The Ohio River Valley Water Sanitation Committee has adopted plans to secure measurements of radioactivity at selected points in the 981-mi length of the Ohio River and at the confluence of principal tributaries. Regular monitoring of the river is planned later so that the commission can check on changes in water quality resulting from future disposal of radioactive waste materials.

Special skills and equipment for the "radioactivity background" study are being supplied through the Robert A. Taft Sanitary Engineering Center of the U. S. Public Health Service in Cincinnati.

In addition, the Public Health Service will evaluate facilities and will provide consultation on radiological testing of water supply sources in each of the eight states that have signed the Ohio River Valley Water Sanitation Compact.

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- Because of their hollow form, National Seamless Pipe Piles can be checked for alignment and condition simply by lowering an electric light into the jetted pile. In open end piles, the bearing area can be checked to assure an even bearing.

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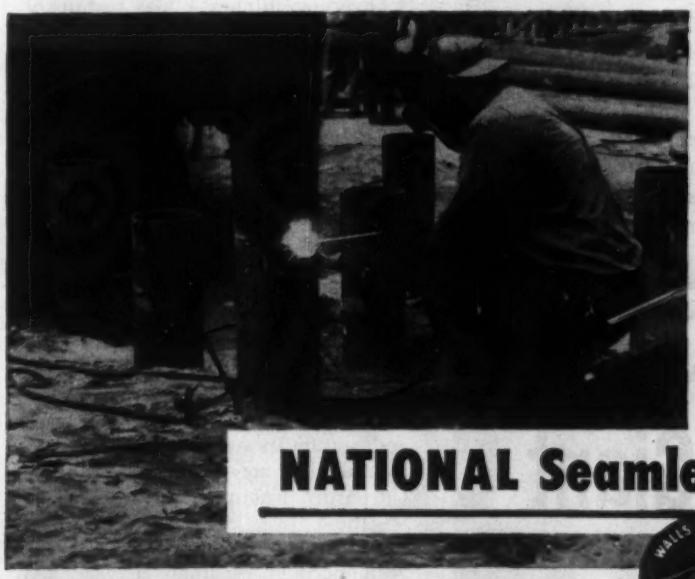

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To mine a very steep bank, Graham Bros. first had to remove several feet of clay-laden soil, loaded with large boulders and thick brush growth. An Intelli-Giant was secured and set to work.

Operating at 160 psi and 850 gpm, the Intelli-Giant washed away burden and undercut boulders with such speed that in a few weeks enough rock had been uncovered to keep the operation running for a full year.

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Flood Control

Albuquerque master plan would curb arroyo floods

A public hearing is scheduled for Dec. 14 in Albuquerque, N. M., on a master plan of the Sandia Conservancy (Flood Control) District, designed to curb disastrous arroyo flash floods such as those that battered the city last summer.

The master plan, prepared by two engineering firms—Gordon Herkenhoff & Associates, of Albuquerque, and Freese & Nichols, of Fort Worth, Tex.—calls for expenditures totaling $16.5 million. The federal government is expected to finance $7.7 million of the total. The balance would be financed by the district through direct levies against property.

Public hearing on the master plan is the first in a long series of statutory requirements that will delay start of construction until July 1957, and completion until December 1959.

Longest delay will be for assessment of benefits against each individual piece of property in the Sandia District, which embraces almost all the eastern half of populous Bernalillo County.

Under New Mexico law, there will be no popular vote on either the master plan or on the property assessments. At the Dec. 14 hearing and later, property owners may file written protests. But final decision will be up to the Sandia District's board and the five district judges in the county.

• **Diversion ditches**—Chief feature of the master plan is a pair of giant diversion ditches to be constructed east of and parallel to the Rio Grande to trap and carry off intermittent floods that pour down the arroyos which drain a vast alluvial plane between the river and the Sandia Mountains.

Rains which pelted the Albuquerque area from mid-July to mid-September this year sent nine destructive flash floods into lowland residential areas. One of these floods caused damages estimated at $1 million.

• **Plans scaled down**—Detailed plans and specifications for the two diversion ditches are being drawn up by the Army Engineers. Size and cost of these two channels have been scaled down from preliminary plans announced more than a year ago (ENR July 29, 1954, p. 53). Originally proposed as structures capable of carrying 50,000 cfs, the north diversion channel will carry about 20,000 cfs.

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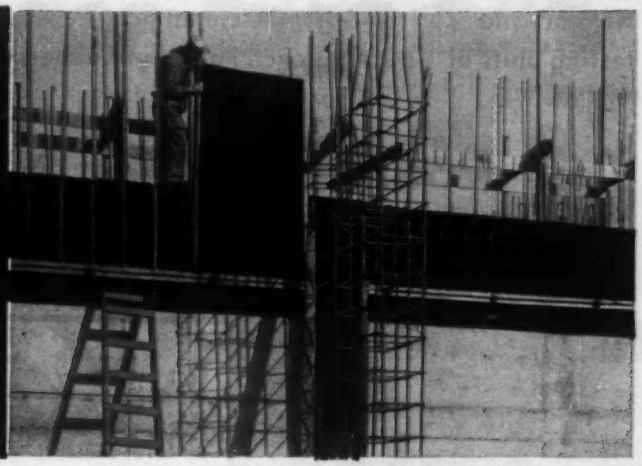
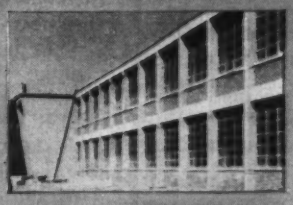


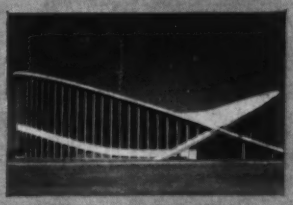
...lowest cost-per-foot-per-use of any concrete form material

...proved in every type of concrete construction

SCHOOL—Paxon Field School at Jacksonville, Florida. Built in 1954 by East Coast Construction Company. President C. Bernard reports, "Harborite panels were re-used twenty times on each side...expect another twenty uses. Edges held up exceptionally well under rough usage and the finished concrete had a smoother finish than that obtained with other form materials."



ARENA—Livestock arena at the State Fair Grounds in Raleigh, North Carolina has drawn international acclaim for beauty and design. Harborite concrete form panels were used in construction of this unique structure. Seats 5400 spectators. Erected in 1953 by William Muirhead Construction Company. Architects were Matthew Nowicki and William Henry Dietrick.



OFFICE BUILDING—New headquarters for the Tacoma City Light offices completed in 1954. Roy T. Earley Construction Company used Harborite concrete form panels for entire exterior surface of building...re-used on adjoining shop building. Contractor says "...more than normal number of re-uses, stripping was easy, finish was held to a minimum." Architect was Silas E. Nelson of Tacoma.

APARTMENT—An outstanding new landmark on Seattle's skyline is the 900 University Apartment house. Harborite concrete forms were used exclusively on the exterior of this 22-story building. Only one set of forms was built. Says contractor Louis E. Baldwin, "These forms have been used 22 times each...are in good enough shape to use on another building of similar size. We recommend Harborite to any contractor." Architect, Earl W. Morrison.

Eighteen years of use in every type or concrete construction has proved that Harborite produces better jobs at lower cost. Harborite's medium-high density overlay is manufactured specifically for concrete form work. Tough, smooth surface will produce glasslike concrete until literally worn away through use. Re-use factor is exceptionally high—50 being common, 2 to 3 times amount not unusual. Special solid core construction of SUPER-Harbord boat plywood adds extra strength and durability. There is no plywood made that matches this material in all 'round quality.

Lower-than-average initial cost combined with high re-usage means important dollar savings. This, with the superior appearance of the finished concrete job, adds up to features that make Harborite a must for cost-and-quality-conscious contractors.

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- ✓ Designed especially for multi-use concrete forms.
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- ✓ Resin-impregnated overlay has great affinity for oils, sealers and lacquers.
- ✓ Will not bleed, run or discolor concrete.
- ✓ Solid core of best plywood made—SUPER-Harbord, the original boat plywood.
- ✓ Lower-than-average initial cost, high re-usage.
- ✓ Oiled and edge-sealed at factory.
- ✓ Available in oversize panels as well as standard 4' x 8' sizes, any thickness.

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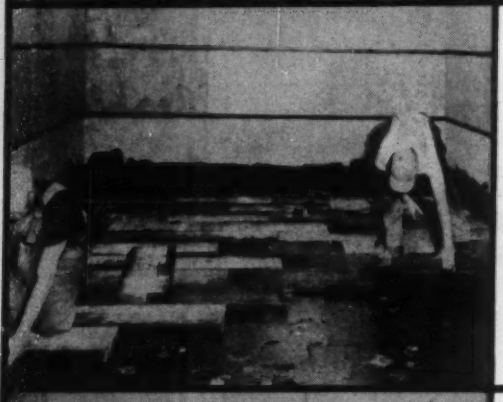
Hot and cold or wet and dry, the climate can be made for testing units at GE's Appliance Park, but builders find . . .

Test Room Insulation No Simple Task

WALLS

DRY room walls were sprayed with cold adhesive and covered with aluminum foil. 3 in. of glass fiber was installed and then faced with asbestos-cement board.

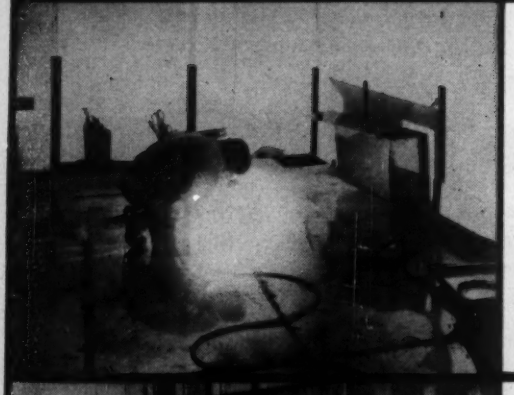
WET room walls got the same treatment but the asbestos-cement facing only served as a backing for an impermeable sheath of stainless steel sheets welded together.



FLOORS

DRY room floors were prepared by applying two layers of roofing felt and two layers of asphalt-glass fiber floor board.

WET room floors got the same basic treatment as the dry rooms; the only difference between the two was the final finish surface.



FINISH

DRY room floors were finished off with a concrete wearing slab. Walls and ceiling finish was of perforated cement-asbestos board.

WET room floors were finished with sheets of stainless welded together to form a vapor barrier. Walls were similarly finished.

TEMPERATURE CONTROL

DRY room temperatures are controlled by heating wires and cooling ducts supported by aluminum structurals. Outlets for appliances are being installed here.

At General Electric's soon to be completed Appliance Park in Louisville, Ky., they're building test rooms in which 0F to 120F temperatures can be controlled to within ½ deg and humidity can be controlled to within 3%.

Two different types of rooms or cells are being built—cold, "dry" rooms, and hot, humid or "wet" rooms.

• **In the "dry" rooms,** a cold adhesive was sprayed on concrete walls that had been drilled to receive toggle bolts. Two layers of aluminum foil were then applied and horizontal wood furring strips were put in place. Glass fiber insulation was pressed between these strips and 2 x 2 studding was nailed vertically to the furring strips. An additional layer of insulation was then pressed into place for a total thickness of 3 in. Perforated asbestos-cement board was used as the finish. Ceilings were similarly constructed.

For floors, two layers of felt were applied and hot mopped; the same procedure was followed with two layers of asphalt-glass fiber floor board. This 4-in. floor was then concreted.

• **In the "wet" rooms,** 3-in. thicknesses of glass fiber insulation were pressed between horizontal and vertical furring and studding as in the dry rooms. But here non-perforated asbestos cement board served as the backing for the vapor barrier and interior finish of stainless steel sheets. Ceiling construction was similar to that used in the walls.

Floor construction was similar to that in the "dry" rooms, except that steel played the triple role of wearing surface, vapor barrier and finish.

The rooms will be used to test household refrigerators and freezers manufactured in other buildings at Appliance Park.

F. A. Fairbrother and G. H. Miehls, Detroit architects, had Albert Kahn Associates, also from Detroit, as consultants; Turner Construction Co. of New York and the Struck Const. Co. of Louisville were the general contractors. Fiberglas Contracting & Supply Division of Owens-Corning-Fiberglas Corp. was the insulation contractor.

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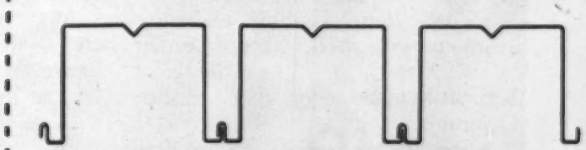

Individual units are 12" wide by 7½" high, rolled from metal-coated steel in 18, 16, 14 and 12 U.S. Gage. Standard lengths up to 32 feet maximum.

For supermarkets and schools much greater latitude of design is allowed by increasing deck span. Considerable saving in structural steel is made possible, and time and labor are cut down in the erection of the deck itself.

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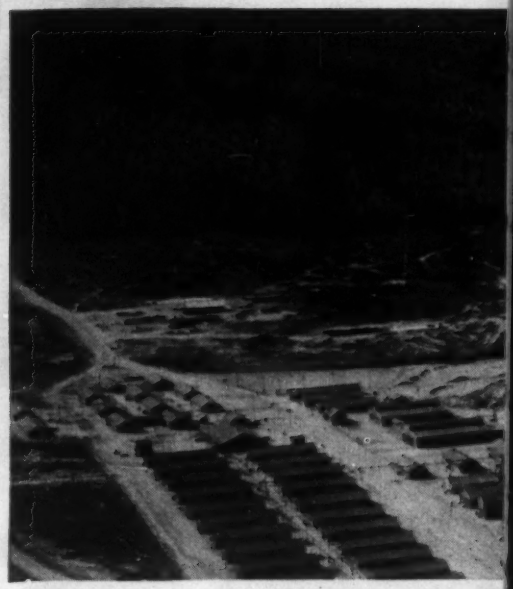
Things are happening in the Canadian wilderness north of the St. Lawrence River—a town, two dams, tunnels, an underground powerhouse. And with it all, a new construction force gains stature.



LABRIEVILLE, QUE.—Construction town wil construction force will come out of the bush ready

Hydro-Quebec Is Developing More Than Horse

Arthur J. Fox, Jr.
Associate Editor

Two things are abuilding in the in the Canadian bush where Hydro-Quebec is harnessing some 1,200,000 horsepower on the Bersimis River:

• First, there is this wilderness hydro project itself, likened earlier (ENR Mar 3, p 28) to the great Kitimat-Kemano job in British Columbia.

• Second, an owner's engineering-construction organization, which one might liken to Ontario Hydro or TVA in their earlier days, is building a trained cadre that has a real future in developing potential of the power-rich Province of Quebec.

How these constructors are performing to get wheels turning in the big underground powerhouse in least possible time is one part of the Bersimis story. How they have organized and contracted for completion of the $225 million project at least possible cost is another part.

In all, the story of Bersimis is an exciting one of engineering and pioneering in a remote area of the so-called "north shore" of Quebec, the largely untamed but rich region of forests and rivers on which the Province confidently stakes its future.

To this wilderness went Hydro-Quebec for the most power producible in the shortest possible time. At $125 per hp, the installation at Bersimis is relatively quite inexpensive, and even after being transmitted almost 400 miles to Montreal it will be cheaper than would be the power from Lachine Rapids on the St. Lawrence just above the city. More important, it will be brought in sooner; first generation at Bersimis is due December, 1956.

In the three years since first survey crews went north from the St. Lawrence at Forestville—45 miles by logging road and the rest of the way with no road at all—as many as 7,000 people have been at work on the remote dam construction and tunneling work.

Labrieville, the construction town, has sprung from nothing to 5,000 people and will become a permanent operating town for the Bersimis project, with its nearest neighbors in Forestville, 85 miles away. Forestville, port town for Anglo-Canadian Pulp Company operations before Bersimis began, is 175 miles down the St. Lawrence from Quebec City.

To Forestville, by ship, plane and road, have come the men, machines and materials that are going into Bersimis. From Forestville there is only the road, over which pounds a never-ending parade of hauling units of all types—up to the 100-ton capacity tractor-trailer units now bringing in penstock liners, turbine components and other heavy pieces.

At Labrieville and its three satelite construction camps, the Bersimis project breaks down into three major parts: dams, tunnels, and underground powerhouse.

The two dams, now near completion, have a specially thin impervious blanket, which made construction interesting, if somewhat difficult.

The 7.5-mile tunnel was completely holed through last June after some 17 months on six 35-ft dia working faces; concrete lining is progressing.

The eight-unit underground powerhouse is especially interesting for its 680-ft vertical surge shaft, now being enlarged to its full top diameter of 84 ft.

• **Two major dams**—Below its outlet from Lake Cassé the Bersimis drops 720 ft in 18 miles. Two rockfill dams are under construction to raise the lake level from El. 1145 to El. 1305 and thus create an 875-ft gross head on turbines inside a downstream mountain, alongside the river but only 7.5 tunnel miles from a bay that is to be created on the enlarged lake.

The two major dams will back water up into Pipmuacan Lake, making a 291-sq mi body of water some 85 miles long to its farthest end. At this end, two minor dams are being built to control overflow from the lake into the adjoining Peribonca River basin. (Actually, Hydro-Quebec may sell water for limited periods—up to 10,000 cfs—for use of Aluminum Company of Canada in the Peribonca valley.)

The so-called Main Dam, on the Bersimis River, is 2,200 ft long, 200

become operators' village and an experienced hydro- for the next such project.

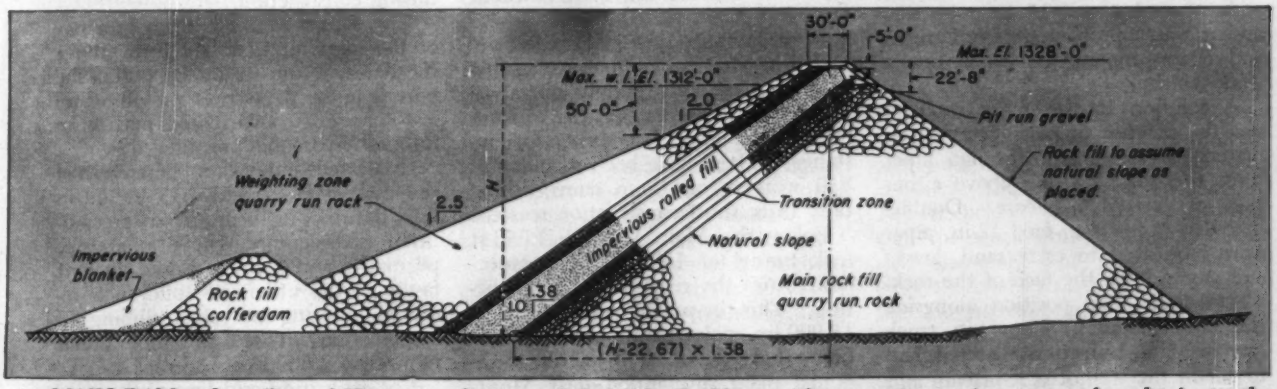
power at Bersimis

ft high and 900 ft wide at the base--a 3,800,000-cu yd structure. A similar but smaller structure alongside, to cut off the Desroches River, is 1,035 ft long and contains 1,302,000 cu yd. The mountain between the two will be carved down to form an uncontrolled rock spillway about 1,000 ft long, at El. 1305.

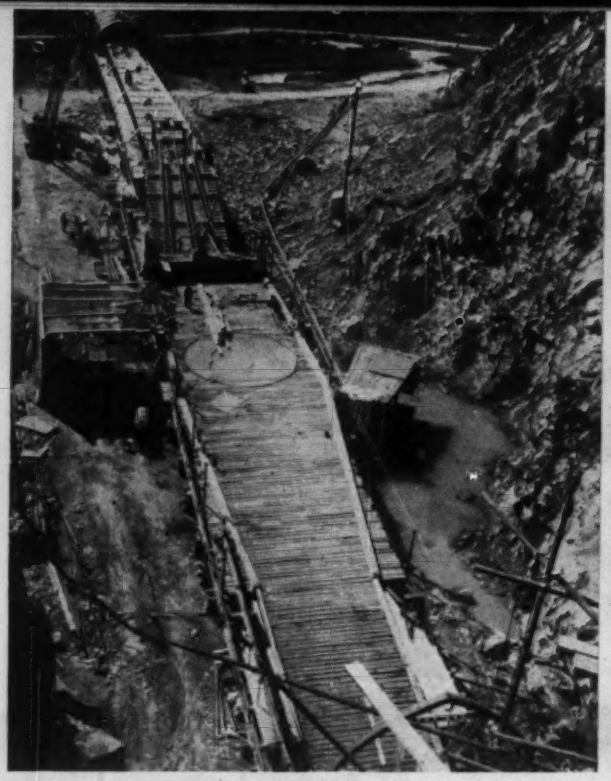
As shown in the drawing of the Main Dam cross-section, these are rock-fills with upstream impervious blankets held down by more rock. On the downstream side of the impervious material is placed a three-layer transition zone varying from 10-in. rock to sand. Upstream there are two layers of sand and gravel, to 3-in. stone.

The impervious rolled fill is not clay but actually glacial till borrowed nearby. (There is lots of hard rock

DAM CONSTRUCTION was influenced by design. Filter material was placed by pipe (not shown) from top of rockfill to lessen traffic on dam's narrow core below.



MAIN DAM and smaller rockfill structure have cores of glacial till. No special compaction equipment was brought in to the remote wilderness construction site; dozers and trucks spread and compacted the core material.



GREAT TUNNEL-LINING JUMBO, strung out on track before entering intake end of 7.5-mile Bersimis power tunnel.

TUNNEL BECOMES MANIFOLD at downstream end where Nos. 6, 7, and 8 of eight penstocks take off to left.

but little else in this rugged area of the Laurentian Shield.) This core material is not as good as clay for the purpose, but it does have the advantage of drying out faster after a rain.

Rock in the dams is being placed as monitors assist compaction with a 150-psi jet of water. For the rolled impervious fill, there is actually no compaction equipment on the dams. It was decided not to bring in pneumatic rollers, sheepsfoot rollers or other such compaction tools, but rather to let the trucks and dozers placing the material compact it with their weight.

• **Close quarters on dam work**—Dam builders at Bersimis may have wished more than once they'd had some good heavy rollers, but actually, finding room for them to work would have been a problem. The Main Dam's impervious core is but 20 ft wide at its bottom, 15 ft at its top, and it was a problem to keep trucks and dozers moving on so narrow a work width.

A solution to the space problem was the practice of placing transition material by feeding it through pipes from the rockfill rising above either side of the dam's core. Double-barrelled hoppers to feed 12-in. pipes were fabricated to carry sand, gravel and stone down the face of the rockfill to their final position alongside the core material. Thus, no truck carrying this transition material had to get in the way of core-placing and compaction.

In the placement of core material, bulldozers pulled loaded rear-dump trucks onto the fill, then spread and compacted their dumped loads. Stones larger than a 4-in. permissible size were hand picked from the fill; a crude grizzly, tried for a time in the "clay" bank, was abandoned in favor of the "rock picking" as a more satisfactory method of keeping the core material quality up to specification.

Quarry-run rock for the two dams has been blasted from a hill close by, with single charges as great as 38 tons of explosive being placed in coyote holes to produce the necessary 5,000,000 cu yd of material. Constructors resorted to 5-ft coyote hole quarrying when 10 churn drills were found not sufficient to keep rock supply up to the rate at which the dam was being built. The method used produced muck 75% of which was ready for use on the dams without secondary blasting.

Both dams are now just being completed in what has been a race against winter in a construction operation thoroughly dependent on the weather (30% lost days last July, for instance). There have been as many as 850 workers on these dams during their three short construction seasons.

Below the Main Dam, a 1,050-ft rock tunnel of 1,200-sq ft cross-section carries the river during construction. This by-passed water feeds a 15,000-hp powerplant on the falls below Lake Cassé; it is an old abandoned plant dismantled near Montreal and hauled in on sleds to begin in 1953 producing power needed temporarily during construction. Because of this use of the diverted water, a regulating valve was necessary on the diversion tunnel to discharge controlled flows through the powerhouse while water is being let to rise behind the dams.

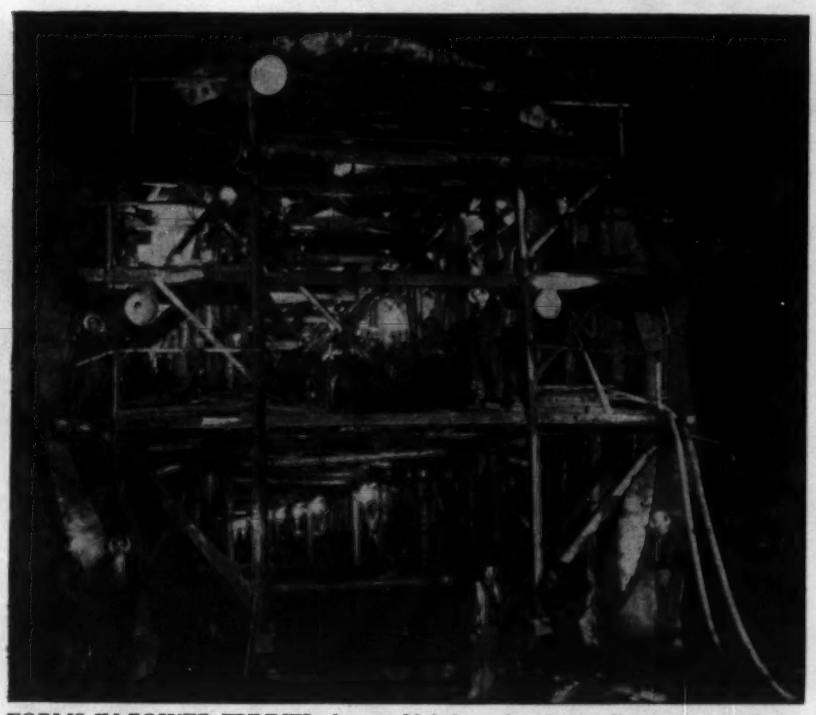
Below the Desroches Dam a 7x7-ft culvert diverts the much smaller stream during construction.

• **Lined horseshoe tunnel**—Hydraulic factors favored it, so the 7.5-mile power tunnel at Bersimis is being lined to a 31-ft horseshoe shape. It will carry 15,000 cfs with a head loss varying between 63 and 99 ft. (The 10-mile Kitimat-Kemano tunnel is unlined, but delivers water at nearly three times Bermisis' gross head.) The horseshoe shape was chosen as giving more room for working vehicles during construction.

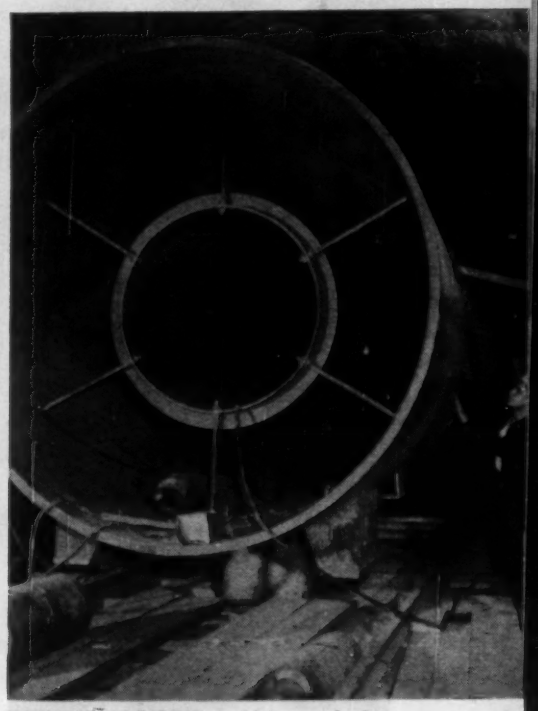
The tunnel intake is deep in a bay of the reservoir that will form above the dams. From its intake portal the bore is under rock cover providing no less than 50% anticipated maximum internal hydraulic pressure.

Evcavated equivalent diameter of the tunnel is roughly 35 ft on a line entirely in bedrock, a precambrian sedimentary gneiss—quartzite, pegmatite and granite. Some ancient faults in the otherwise solid rock required grouting and steel ribbing in one section. There was not much more than 2,000 ft of bad rock.

For excavation and lining, the tunnel was divided into three sections



FORMS IN POWER TUNNEL shape a 31-ft horseshoe lining for pneumatic placing of arch concrete.



PENSTOCK LINER is 1¼-in. steel plate to be backed with concrete.

reached by three adits. Two upstream sections were each about 16,000 ft with 2,500-ft adits; the downstream section, done by the same force tunneling the powerhouse, was about 8,000 ft and had a 1,400-ft adit. Adits were 26 ft high and 32 ft wide.

Tunneling progressed on six headings at an average total advance of 732 ft per week. Maximum footage on any one face was 229 ft in the week of last Feb. 12 in tunnel section No. 1. All six headings were being worked beginning January 1954. The final holing through was celebrated in section No. 1, farthest from the powerhouse, last June 9.

Tunnel operations have proceeded 12 months a year. Miners on the 16-drill jumbos work in the same clothes year-around despite 50-below temperatures outside which bring other construction practically to a standstill.

Tunneling methods typically called for loading of 160 drill holes 17 ft deep with 2,075 lb of 40% dynamite to be exploded over a 225-1200 millisecond long delay period.

Rock was good and the drill-blast-muck routine was normal throughout most of the 7.5 miles tunneled. Through the roughly 1,300 ft of relatively bad rock in the upstream section, directly below a lake called "XX", it was necessary to inject about 2,000 cu yd of grout to keep the lake from leaking into the tunnel.

• **Tunnel lining pushed now**—With the big delivery tunnel holed through, concreting of the lining is the current operation. The arch is being poured first, to a minimum thickness of 18 in.; invert concreting will follow.

Concrete requirements are very tricky. A 3,000-psi mix must be attained with 480 lb of cement (5½ Canadian bags) per cu yard. It must have a fast rate of early set against cold rock of the tunnel, since forms are being stripped after only 11 hours to be moved and reused in a 24-hr pouring cycle.

Trickiest requirement of all is that the desired fast initial set must take place after a period up to two hours during which set retardation is desired. This period is the time concrete is in 8-cu yd dump trucks for the haul between mixing plant and pour.

Also, since sand found locally and used in the mix accidentally contains more entrained air than desirable, it was required that the mix have its entrained air reduced.

Admixtures used in the attempt to do all these things—retard initial set for about two hours and speed initial set after two hours while also "detraining" air—have been the air-entraining agent Pozzolith, 1½ lb per cu yd, and ADA, an air-detraining agent.

All concrete is produced at a central plant, and some of the hauling distances reach as high as eight miles.

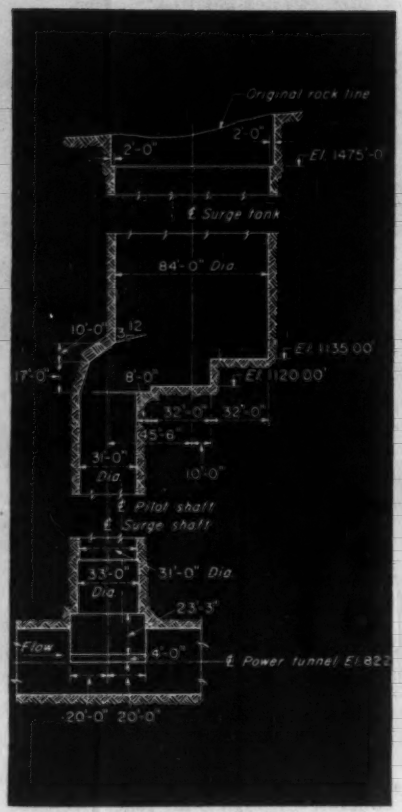
Trucks enter the tunnel through an adit, ride up a ramp at the particular work site, turn on a turntable, and dump into receiving hoppers through a grillage intended to give the concrete a certain amount of remix. The hoppers charge three pneumatic concrete placers which "gun" the wet concrete through 6-in. pipes overhead of the tunnel liner forms to a box at the rear form. From this box, concrete runs off both sides to fill the side wall, and eventually the whole arch. As the arch fills, the pipes are shortened and pouring is continued back toward the end of the forms nearest the concrete placers. There are 320 ft of non-telescoping steel forms in use (in 5-ft sections). Pours are made in 80, 120, and 160-ft lengths.

The longest track-mounted concreting jumbo measures 280 ft, including: ramp and turntable for trucks; hoppers and pneumatic placers for the concrete; the traveler on which are moved the forms (see photo).

• **Penstocks and surge shaft**—Apart from the 7.5-mile delivery tunnel, there are two very difficult tunneling operations on the Bersimis project.

First, there are the penstock tunnels for the eight turbines, all going in at once. These take off at 60 deg in plan from the main tunnel, a sort of manifold at its downstream end, and drop at a 50-deg angle from horizontal to the scroll case level some 385 ft below. This meant mining eight penstock tunnels with 16-ft inside diameter. The main section is concrete-lined to 12-ft diameter, while the downstream part is steel-lined (1¼-in. thickness) to 10, 9½ and 9-ft diameter, reducing further to a 7-ft 9-in. straight flow valve.

For inclined penstock mining a 6-ft



SURGE SHAFT AND TANK 33 and 84 ft are major excavation operation.

AT TOP OF SURGE TANK in 84-ft excavation, muck slides down 10-ft pilot shaft for removal from power tunnel over 600 ft below. Upward vertical mining of pilot shaft was done first.

pilot raise was cut out first, from bottom-up, then penstock enlargement followed from top-down to full diameter of section. By this method, muck is let slide down to the powerhouse level for removal by trucks. Horizontal sections were mined full-force.

If mining of the steep penstocks sounds difficult, consider the upward mining of a 680-ft long, 10-ft diameter vertical pilot shaft for the plant's vertical, rock-hewn surge shaft and tank (see above).

As shown in cross-section in the accompanying drawing, the surge shaft rises from the power tunnel at El. 822 just above the penstock to El. 1,500. It is roughly a 320-ft shaft of mostly 31-ft excavated diameter to be lined to 27 ft. Then there is a transition in which the centerline is offset 45 ft 6 in. and the excavation goes from 31-ft shaft to 84-ft diameter tank. The 84-ft diameter excavation extends up from El. 1,135 for about 360 ft to open onto the hilltop towering over Labrieville and the powerhouse level far below.

The 10-ft pilot shaft for this combined surge shaft and surge tank was mined upward from the power tunnel —some 680 ft of vertical tunneling up to ground level. Since the pilot raise has been finished, rock excavation has been working from the top down.

Drillers and blasters are carving the rock tank to its 84-ft diameter. Far below, in the power tunnel, trucks are hauling out the muck as it slides down the vertical pilot shaft.

The top 10 to 15 ft of the surge tank will have a concrete-lined wall; below that, walls are gunited for protection of miners. A top cover for the tank will be built to rest on its walls just above ground level. Top of the surge tank will be about 200 ft above normal high water level in the reservoir. Surges are expected to cause 540-psi pressures in the powerhouse penstocks.

• **Powerhouse cavern**—The eight 150,000-hp Francis units (rated at 785-ft head and 277 rpm) will be housed in a cavern to measure 565x65x80 ft high. Total depth of powerhouse excavation at each unit—from roof to bottom of draft tube excavation—is about 110 ft.

Studies showed that to divide the available water among a greater number of smaller units would cost an additional $1 million per added unit. The 150,000-hp turbines were settled on, and generators to be installed are rated at 138,000 kva, 95% power-factor, under favorable cooling water conditions.

It is interesting that instead of tapping power to run pumps for cooling, this plant will tap penstock flow at some 400 psi, put it through a jet in an eductor to pick up tailrace water for a 25-psi cooling system. Reliability and simplicity are claimed as advantages; there is no real over-all efficiency gain.

From a concrete-lined powerhouse roof arch will hang a suspended ceiling, and along bare rock walls stand structural concrete supports for a 60-ft 6-in. bridge crane, 400-ton.

Parallel to the powerhouse, and connected to it by the eight draft tubes, a 1,000-ft tailrace tunnel roughly 47x75 ft connects with a channel to return flow to the Bersimis River. The tailrace tunnel is designed never to flow under pressure, always less than full even though all eight units may be going full tilt.

Cable tunnel (6x8 ft) will connect the powerhouse to its outdoor switchyard. The outdoor transformer and switching station, built at the base of a hill, will be protected from falling rock.

Power from Bersimis will be transmitted to Charlesbourg terminal, near Quebec City, over two double circuit 300-kv lines. Conductors will measure 1,272,000 circular mills and will be made up of 54 strands of aluminum, 19 strands of steel. There will be two ground wires made of $\frac{7}{16}$-in. extra high-strength galvanized crucible steel.

Double circuit steel towers 138 ft

high will carry cable spans averaging nearly 1,200 ft. Over the Saguenay River, the lines will span 5,000 ft from 200-ft towers on hilltops, for a 170-ft clearance above the river.

Transmission line construction—the main line some 400 miles to Quebec and Montreal, plus a line and submarine cable south to the Gaspe Peninsula—is almost a story in itself. Transmission for such distances over such rugged, forested terrain will represent about one-third the total cost of the project.

Bersimis Work Was Organized for Economy

Hydro-Quebec, building Bersimis, has organized a formidable construction force with an increasing amount of know-how. In addition, the provincial power agency has shown ways of taking many costly imponderables out of construction—especially construction in the wilderness.

Costs have been engineered to a minimum, with every design, every contract worked out to give Hydro-Quebec the most for its money.

Contractor relationships indicate best how far Hydro-Quebec has gone to get its dollar's worth.

● Purchasing

To begin with, there are six major contractors, but they are called (officially) "agents". This legal device makes it possible for Hydro-Quebec to do all buying of materials and equipment, and as a government agency (a so-called "crown company") it can avoid a 5% provincial sales tax on some $80 to $90 million worth of purchases.

Having done all the buying for the job, the owner, Hydro-Quebec, has not only saved the big sales tax but has reduced total cost of the project by seeing that only enough material to do the job is shipped and hauled up to the remote project area.

● Payrolls

Completely relieved of the acquisition problems of equipment and materials, the contractors have only construction as their concern. They don't even have to worry about payrolls; these are handled by Hydro-Quebec.

Actually, all Hydro-Quebec is buying from the six big contractors on the project is their know-how, their management and supervisory brains.

In return for their services, the six owner's agents or contractors are paid a fixed fee. And as an additional incentive on the tunnel and dam construction work, there is an additional "target" fee. It is an arrangement whereby estimated unit prices have been established, and the contractor can earn up to a target amount above his fixed fee by keeping within the estimates, the owner keeping a close accounting of costs.

Equipment rental from the owner's pool is chargeable to the contractor while he uses it; it is returned to the pool for re-rental after use, and not much equipment lays idle.

● "Agents"

The major contractors at work on Bersimis are:

Komo Construction Ltd., which built the wharf and handling facilities at Forestville plus the buildings at Labrieville.

Dufresne Engineering Ltd. built all cement, aggregate and concrete plants supplying the whole project; operates the shops servicing all equipment on the project; does all concrete work within the powerhouse.

Cartier Construction Ltd. which excavated and is lining section 1 of the power tunnel, plus the intake.

Atlas Construction Ltd. on section 2.

Perini (Quebec) Ltd. on section 3 of the tunnel as well as the powerhouse excavation, including penstocks and surge tank.

Angus Robertson Ltd. which has been the dam constructor.

These contractors are understandably somewhat less enthusiastic about the "agent" relationship on this construction project than is their employer, the owner.

Everything about the contractual relationship has been designed to take unknowns and risk out of this particular venture into the wilderness. With much of the gamble gone, costs certainly have been cut. But along with the contractor's chance of taking a loss went also any chance of making a great profit at Bersimis.

Aside from controls on his profit, the contractor at Bersimis may at times have felt checked by controls on his operations; there is only the equipment Hydro-Quebec makes available.

On the whole, however, Hydro-Quebec engineers say the contractors have been fairly well satisfied, might enter into such a business arrangement again.

● Logistics

Logistics for such a job as this is a major engineering problem in itself. For example, cement by ship from Montreal is pumped to a silo ashore at Forestville. But the cement trucks must make a never-ending delivery from Forestville to the job lest the limited available storage space break the continuity of supply.

Everything needed by a vast hydro project and the thousands of workers on it must go by road to Labrieville. The so-called "stores", the warehouses full of tools, parts, and every imaginable kind of hardware, have an impressive $4-million inventory of supplies. This is in addition to an estimated $11 million worth of construction equipment on the work at its peak to date, not including small tools and equipment.

The men who are pushing this great project to completion (first power in '56) include F. Rousseau, chief engineer of Hydro-Quebec's power development division; F. Willows, superintending engineer of construction; J. Parker, co-ordinator on the project; L. Allard, superintendent at Bersimis who handles the big equipment pool; J. H. Huggard, chief resident engineer; J. Bourbeau, cost engineer who watches over the unusual contractual arrangements.

H. G. Acres, consulting engineers of Niagara Falls, Ont., designed the project and keep a small engineering force in residence.

How did one county respond to "Ready or not, here we come!" —They got the kids to school before city sewerage was in.

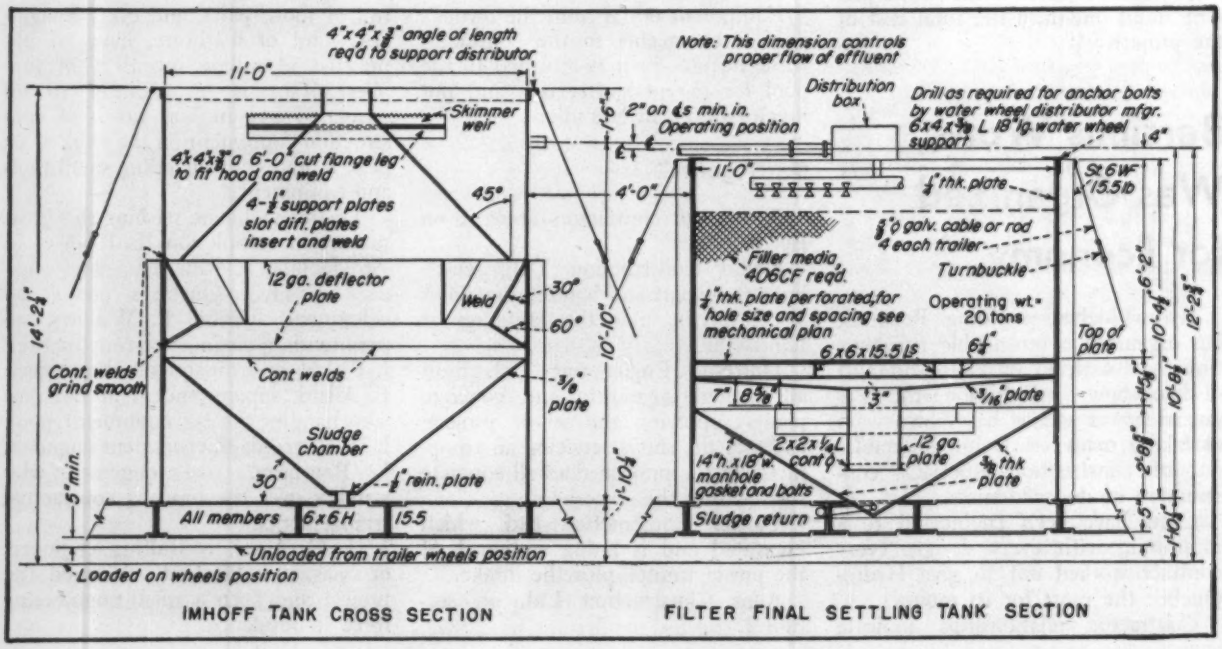
HERE'S HOW: Trucked-in portable units were . . .

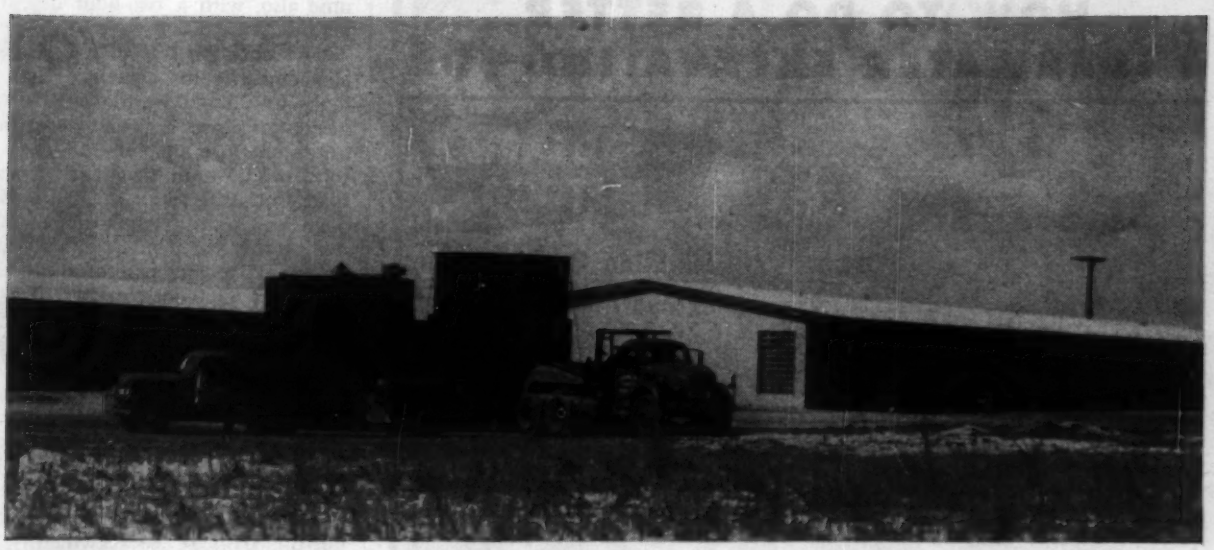
Portable Sewage Plant Fills in Gap unti

Out of localized crises often come devices that serve a general need. And out of such an emergency has evolved a portable all-steel sewage plant that can follow schools around fast-growing Dade County, Florida. Designed according to specifications set up by the county's board of public instruction, this facility is counted on to save its cost in less than ten moves.

Need for school construction is a problem facing nearly all communities, but Dade County claims a distinction born of troubles that are far from commonplace. An estimated 30,000 people per year are migrating to the area as permanent residents—in addition to the annual visitation of more than a million tourists—and the result is an enrollment increase on the order of 10,000 public school students per year. In terms of classrooms, this represents a solid demand yearly for more than 300, even at the relatively large capacity of 30 pupils to the room.

The county has 19 complete portable school centers that consist of classrooms, toilet facilities and cafeterias. These are moved from community to community as need for school buildings develops, and at each new site sewage disposal is accomplished through use of septic tanks and drainage fields. These facilities are replaced by permanent structures as time and funds permit. One of the most difficult problems is that of acquisition of sites that must be purchased sometimes years ahead in anticipation of housing developments that may spring up. In some cases site purchase has





. . . hooked together and served school until time to move on to new site.

Permanent Facilities Are Set

been accomplished five years ahead of actual development in affected areas.

• **A new problem**—Bay Harbor Village, built on three man-made islands, not only had the land available for the Treasure Island Elementary School, but funds were on hand for its construction. The only obstacle to completion of the structure was the absence of a sewage collection system on the island. A septic tank and drainage field was out of the question because the filled land area was clay and shell pumped out of the bay bottom, and permeability tests showed penetration of almost zero.

While a complete sewerage system had been planned and engineered to serve Bay Harbor Village, the school would have been built before the system was placed in operation. The school board had to find means for collection, treatment and disposal during period before sewerage caught up.

The first consideration was a permanent conventional system on the school grounds that would render the institution independent of community sewerage plans. The facilities would have included a treatment plant—completely covered under state board of health regulations—from which final effluent would be pumped 300 ft to the bay. Not only would this have resulted in elimination of some valuable playground area, but the cost of $35,000 and duplication in expenditures resulted in abandonment of the plan.

Another possible solution was to build a sewage collection station and a pumping station to pump the waste to the municipal sewerage system of the City of Miami Beach. This, however, would have necessitated a 3-mi-long pipeline with a submarine crossing of a navigable stream, at an estimated cost of $40,000, plus the possibility of delay due to prolonged negotiation for the crossing with the state highway department, the Army Engineers, the City of Miami Beach and the surrounding village. The combination of hurdles to this plan, together with the fact that all work would be abandoned when the village completed its own project, doomed this plan, too.

• **Its solution**—The state's board of health was finally prevailed upon to waive some of the rigid requirements on provision that a plant on school premises would be strictly temporary—to be used only until such time as the village sewer system was ready to operate.

Out of these concessions emerged the plan for construction of the portable, light-weight, all-steel treatment plant that could be dismantled and hauled away when its usefulness at a location ended.

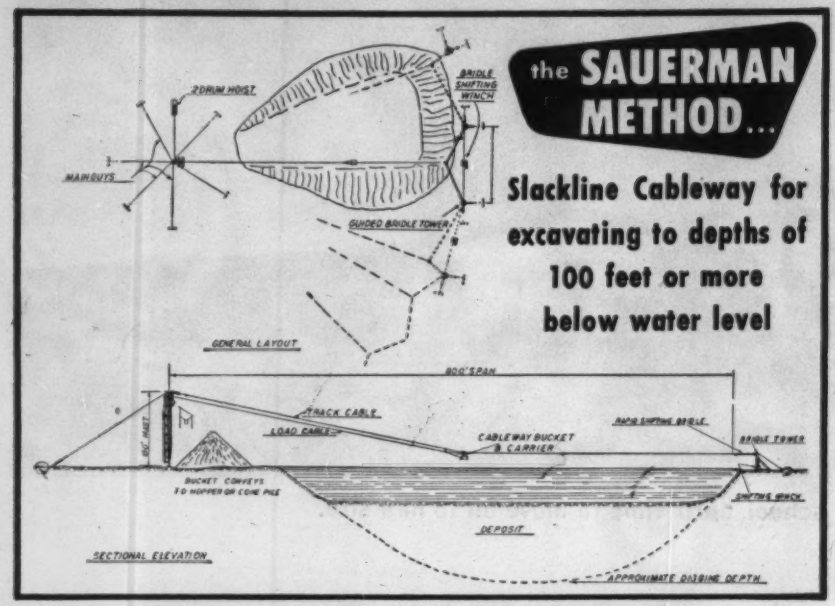
It was at this point in the planning that James N. Owens, school board mechanical engineer began the studies that led to design of the county's first portable sewage treatment unit. Design requirements called for a plant that would serve a 400-person 12-gal-per-capita-per-day flow rate. The board establishes between four and eight temporary school structures per year, and a portable plant of this type could save the $2,000 cost of the septic tank and field with each move. At the rate of undiminishing growth in the area, the plant can be re-used many times.

Owens' first task was to query equipment manufacturers on the availability of ready-made equipment that would serve the Bay Harbor Village purpose. Since none manufactured a package unit that answered specific village requirements, the new plant was designed according to board recommendations.

The design as it evolved, was for a two-unit, complete treatment facility, consisting of an Imhoff tank for sludge digestion and primary settling in the first unit and a trickling filter with final sedimentation and sludge return facilities in the second. Designed for the 400-person capacity and 12-gal-per-capita-per-day flow rate with a five-day BOD of 200 ppm, a six-hour day operation figures at 14-gpm rate of flow.

The sludge digestion and settling tank were calculated at a 240 cu ft volume with a two-hour detention period. The trickling filter was figured at 600 lb applied BOD per acre-ft of filter media, 33% efficiency, 506 lb BOD applied daily, and a volume of 400 cu ft. The final sedimentation tank was calculated at 240 cu ft vol-

HOW TO DO A BETTER UNDERWATER EXCAVATING JOB



Above drawing was prepared for a specific slackline installation and does not represent maximum spans. Rapid shifting bridle is not needed for many deposits.

Cableway at Cabinet Gorge Dam digs and hauls from tailrace 1000 ft. away. **(Full details in Sauerman News No. 143.)**

New York gravel producer switched to cableway for underwater operation of his pit. Average haul is 600 ft. from a 50-ft. depth **(Sauerman News No. 141).**

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ume also, with a two-hour detention period.

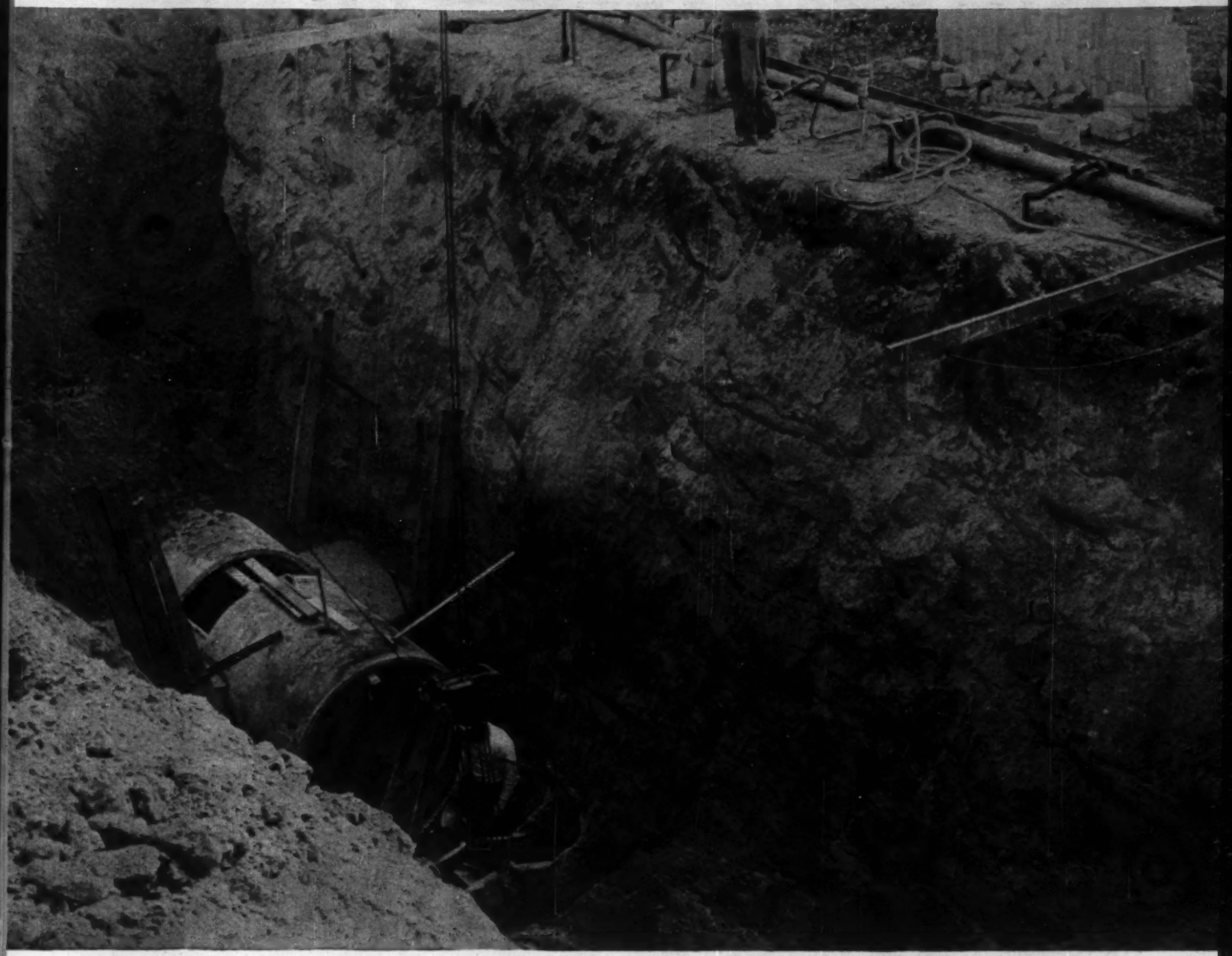
The next job was to check design characteristics for assurance that the tanks would not be too large or too heavy for state highway department limitations on maximum load (15 tons) or maximum height (14 ft above road surface). The Leonard Bros. Transfer Co., of Miami, offered information that the plant as figured could be moved to any part of the county for about $200 in a matter of a few hours, and could be disconnected, moved and re-connected in a couple of days at the most.

The rest of the job was one of elementary engineering design to fit various parts of the plant together according to limits imposed. One serious obstacle to overcome was the weight of filter media—originally calculated on the basis of rock, which, when added to the trailer and filter unit weight exceeded the allowable load limits for the highways. Using rock, filter media would have been shoveled out of the tank, transported separately to the new site and replaced. Once again the state board of health was called in, and as in the first instance, a concession was granted. Use of an unorthodox filter media was considered and approved.

• **Wood filter medium used** – The board of health had experimented with wooden blocks instead of rock at the University of Florida, and found it satisfactory. It was therefore reasonable on the basis of these studies, for the school board to use 1½-in. x 3-in. wooden blocks in lieu of the rock as originally planned. This concession resulted in a reduction in operating weight of the filter unit to 20 tons, with an over-the-road weight held within the state requirements. It also reduced danger of disrupting bacterial activity that might be seriously hampered by the move. The filter, as built with wood blocks can be moved totally intact, thus much time should be saved in putting them in operation.

Contract for construction of the plant was awarded to G. M. Dykes Iron Works on its low bid of $14,800. Another contract for $2,500 covered piping, connections, and wiring. Thus the total in-place, in-operation cost of the double unit was about $17,300, which can be written off in less than ten moves—figuring what septic tank systems would cost—when it is re-used at other school sites. Of interest is the fact that construction work on the Bay Harbor village sewerage system did not start until the same day the Treasure Island Elementary School opened with its portable sewage treatment plant operating satisfactorily.

Wellpoints Wring 10 Feet of Water Out of **POWDER-FINE SAND**



Contractor: Gabes Construction Co., Sheboygan, Wisconsin

Excavating a 15′ trench in very fine, water-bearing sand and silt with hard blue clay at subgrade can be quite a problem. So much so that the first attempt to build a storm sewer in this particular area of Sheboygan, Wisconsin, was abandoned.

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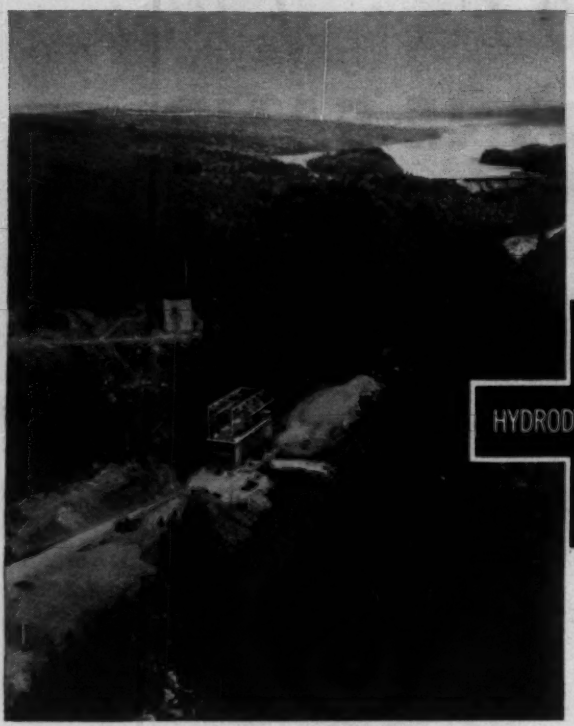
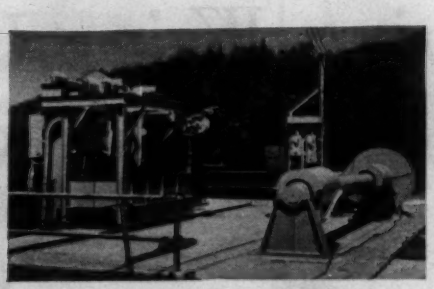
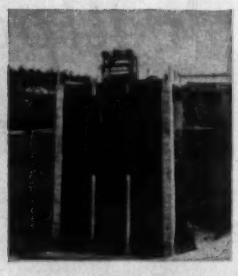
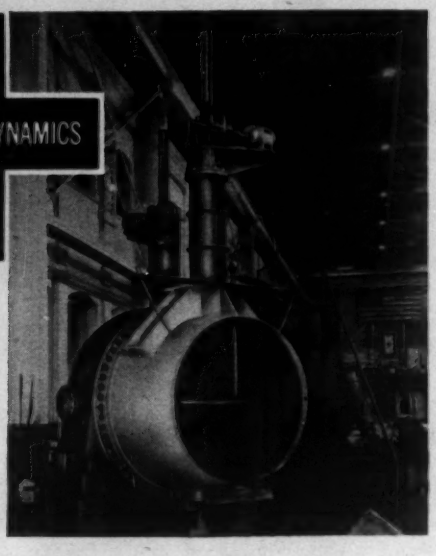


A 16-foot diameter tunnel leads from Ripogenus Dam to the surge tank, from which two penstocks feed the McKay Station turbines. Each turbine has a plate steel spiral case, shop welded in two halves with riveted butt strap connections. SMS accessory equipment is installed at the dam and in the station. Consulting Engineers: Stone and Webster Engineering Corp.





SMS intake gate is installed at the left end of the dam. The 10-foot trash rack rake and self-contained trash car are shown (above) in lowering position above the center rack. Upper left photo shows rear view of the hoist support and trash car, with the 60,000 lb. intake gate hoist in the foreground.



Motor-operated Dow valves, installed at the inlet of each spiral case, provide tight shut-off. Note the streamlined valve disc and housing around operating link connection to the disc.

SMS TURBINES POWER RIPOGENUS EXPANSION

On the upper Penobscot River, Ripogenus Dam had been a storage reservoir for Great Northern Paper Company's downstream power plants since 1916. When studies made in 1950 indicated more power was needed, McKay Station was built. A 4,000-foot, rock-lined tunnel, leading from a new intake in the dam face to the power house below, created a net effective head of 175 feet. Two vertical SMS-Francis turbines, rated at 16,590 hp, were installed, and provision made for the ultimate addition of another unit.

SMS hydraulic equipment was chosen for the entire project. The 18 x 20-foot fixed wheel turbine intake gate is operated by a twin-drum, motor-driven chain hoist. A special log-grapple type trash rack rake keeps the intake free of pulp wood and other debris. Two 108-inch SMS-Dow valves provide shut-off at the turbine inlets.

This Ripogenus hydroelectric expansion typifies S. Morgan Smith's ability to satisfy the complete needs of any project. Over 75 years of world-wide experience in design and manufacture of hydraulic turbines and accessories assures you of equipment that will meet the highest standards. For full information, write S. Morgan Smith Company, York, Pennsylvania.

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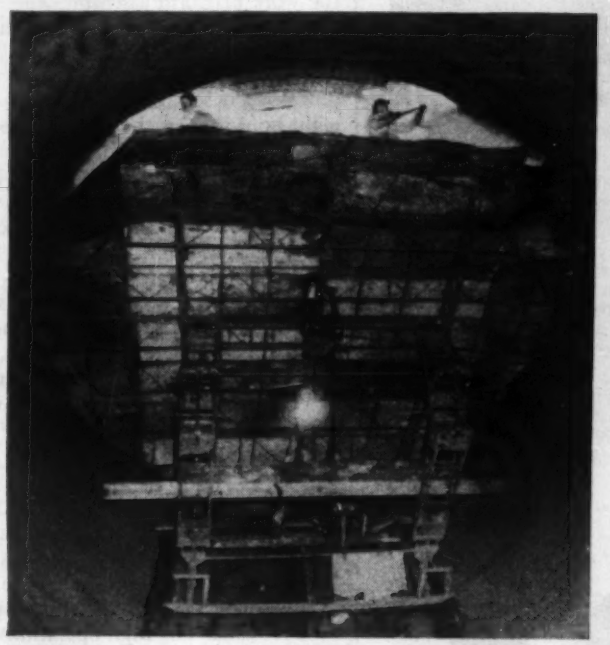
CONTROLLABLE-PITCH SHIP PROPELLERS

SMS

S. MORGAN SMITH

AFFILIATE: S. MORGAN SMITH, CANADA, LIMITED, TORONTO

Completed penstocks at Chief Joseph Dam on the Columbia have been coated inside by . . .



"Dobbers" on an adjustable rubber-tired staging assembly.

"Coal-tar express" runs hot coal-tar to dobbing crew.

New Rig Eases Penstock Coating

All 16 penstocks completed at Chief Joseph Dam have been cleaned and coated inside, and scroll-case interiors are being coated as installed. To sand-blast and coat the 305-ft lengths of these 25-ft penstocks, the contractor devised a movable staging assembly—an always-level work platform to ride on a slope of 45 deg.

The rubber-tired assembly used in Chief Joseph's penstocks had adjustable steel jaws (see photo) for positioning and leveling the work platform. The platform itself was roughly eliptical in shape and 32 ft long, big enough to fill the pipe cross-section and make falling off impossible for the workmen.

Gustafson Coating and Blasting Co., veteran specialty contractor from Coeur d' Alene, Idaho, has the $250,000 penstock-and-scrollcase work at Chief Joseph. The contract includes also the exterior aluminum painting of penstocks.

Each of these penstocks has capacity for 6,500 cfs; each feeds a

weil Super HEAVY DUTY Sewage Ejector

• SCREENLESS
• RUGGEDLY BUILT
• NON-CLOG IMPELLER

THE ECONOMICAL SEWAGE PUMP with the *NON-CLOG impeller!*

This WEIL Screenless Heavy Duty Non-Clogging Sewage Ejector is ruggedly built for years of trouble-free operation. WEIL Pumps of this design are still operating satisfactorily after 25 years of service.

This unit is completely factory assembled, economical to install — only one piping connection is required. Pre-assembly and factory testing insure LESS installation time and no "call-back" servicing.

Inherent in the design of this pump is an ample reserve of strength to meet the most severe conditions. The ease and simplicity of installation and the record of many years of trouble-free operation make this pump the logical choice with the engineer, contractor and owner.

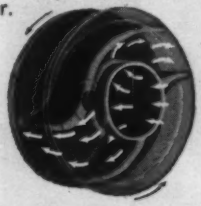


Fig. C-9001

This Two Blade NON-CLOG Impeller is the most important part of the screenless non-clog sewage pump. Not only does it effectively handle large diameter solids but it also passes rags and stringy material of various lengths which are washed into the sewage pit. Pumps with this impeller successfully handle difficult pumping jobs such as waste from public toilets, canning plants, hospitals and industrial installations.

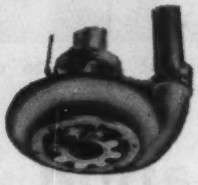


Fig. C-9021

This rugged pump casing with wide waterways permits unobstructed passage of the maximum solids handled by a non-clog impeller.

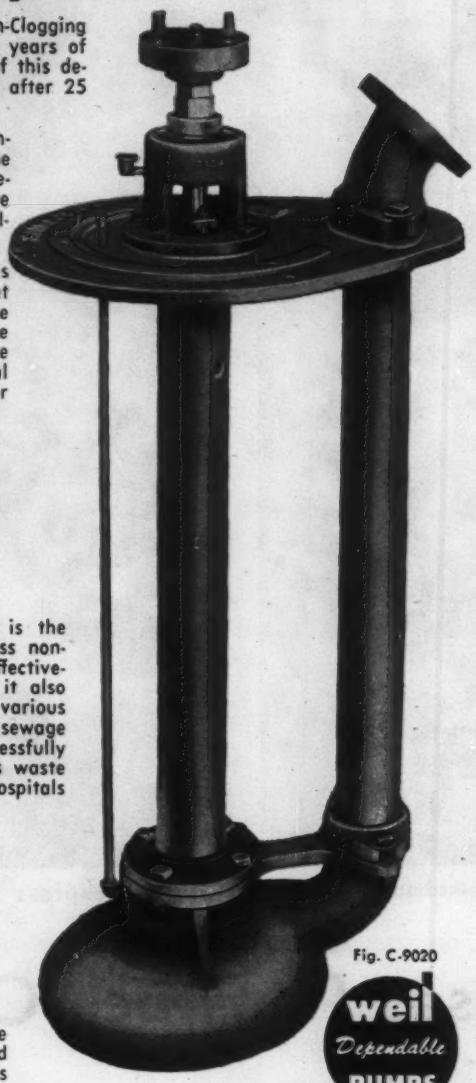


Fig. C-9020

weil Dependable PUMPS

Send for NEW Bulletin C-900 E

weil PUMP CO.

1528 NORTH FREMONT STREET • CHICAGO, ILLINOIS

100,000-hp turbine. Gustafson's job is to clean and coat the steel tubes to prevent corrosion. His protective coating should last 50 to 100 years, says Roy Gustafson, and withstand temperatures ranging from −4 to 120 F.

Sand-blasting of the steel is the first step. Then, before the sand-blasted surface can oxidize, it must be painted immediately with a primer coat, a cold coal-tar enamel. Final step is the application of the hot coal-tar enamel.

• **Handling hot coat-tar**—Heating of the coal-tar enamel was done right in the penstocks at a point some 100 ft down from their tops. In asbestos-lined pots over propane burners, the material was heated to 500 deg F, temperature of application. Heating kettles each hold 1000 lb of coal tar, which heats up to 500 deg in about two hours.

Heated material in insulated buckets was delivered up or down the big penstocks on a cable-drawn buggy to the work platform assembly where the "dobbing crew" was at work on the coating work.

Each man in a dobbing crew wore out three or more 6-in. dobbers each eight-hour shift as the ⅛-in. protective coat was applied (1 lb/sq ft).

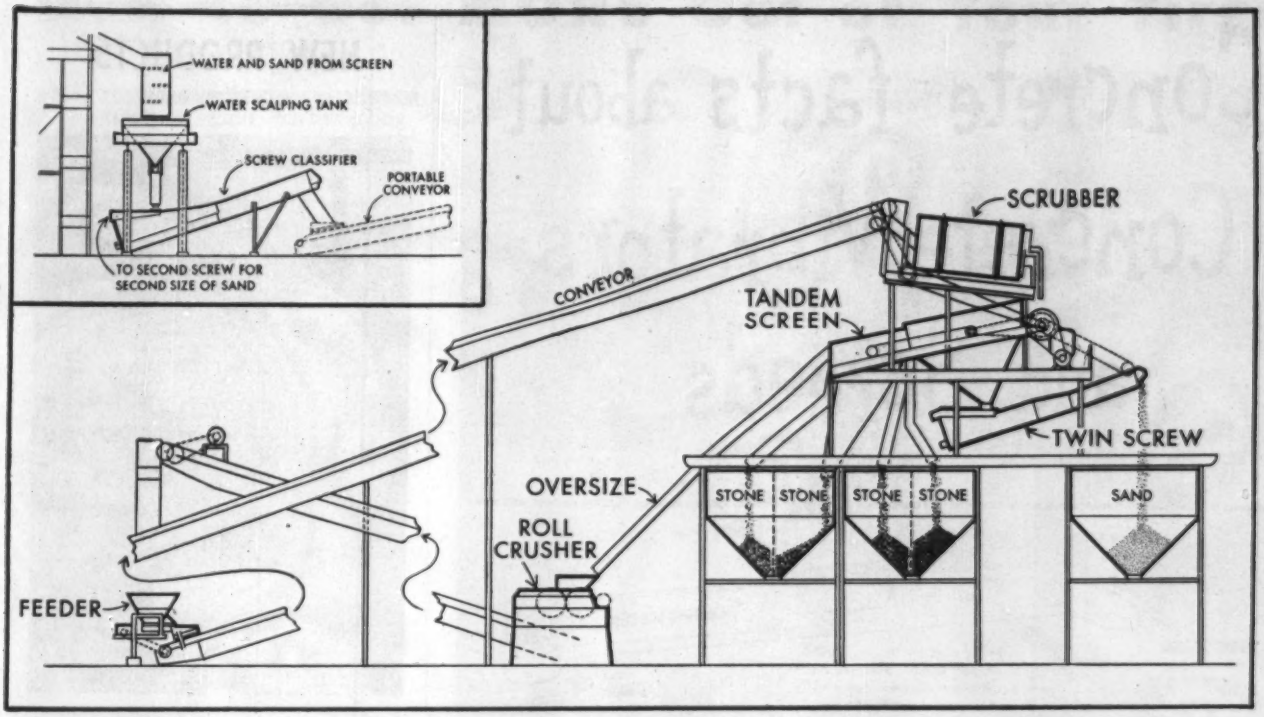
Fans pulled smoke and fumes from the penstock as the coating work progressed. Workmen wore respirators.

• **Coating is checked**—Once a penstock is coated, the entire inside surface is submitted to the spark-test of a 10,000-volt electric detector. If holes or flaws are found, they are easily fixed by the dobbing crew.

A crew of eight men took four days to coat one of these big penstocks. At least one additional day would be spent in setting up operations inside the tube; another day would be spent in dismantling for the move to the next penstock. So about one-third of the time on this operation was spent in rigging and preparations for actual coating work. Sand-blasting could proceed in one penstock while hot coating went on in another to save time.

Chief Joseph Dam is under supervision of the Seattle District of the Corps of Engineers. As a unit in the comprehensive plan for development of the Columbia River Basin, it began commercial production of power last August 20. Ultimately, the present 16-unit powerhouse is intended to be extended to 27 power units of 64,000 kw—total, 1,728,000 kw.

The $169 million Chief Joseph project is located on the Columbia downstream from Grand Coulee Dam.



Why this "packaged" washing plant fits big-job operations

Produces up to seven sizes at 150 tph clip

Here's a big package-type washing plant that will supply huge quantities of thoroughly cleaned and sized sand and gravel to fill every demand made by your job, *no matter how big!* It's PIONEER'S new 405-W Washing Plant.

150 tons per hour is a lot of production in any language. **Yet the new 405-W not only gives you this tremendous output but also enables you to produce 2 different sizes of sand and 5 sizes of stone *simultaneously*, including oversize, which you can crush and run back through the screens. If you need fewer sizes, production can be even greater! For example, users report 200 to 215 tons per hour when separating and washing three sizes of gravel and one of sand!**

Secrets of high production

Big-plant proportions are one reason for such high production, but it takes *three* secrets, other than size, to process such huge quantities.

The first secret is the way in which the vibrating screen functions. This 4'x20' tandem screen simultaneously separates up to 5 sizes of material, plus oversize, chuting four sizes of aggregates to storage bins, one size of sand to the dehydrator, and oversize to the crusher for reduction. A second size of sand can be produced when desired.

Utilization, rather than *rejection* of oversize is the second production secret. All oversize scalped off by the screen is chuted to a PIONEER roll or jaw crusher for reduction and fed back to the plant for re-processing.

Maintaining an even, continuous flow of material through the plant is the third production secret. PIONEER'S Model 30G Mechanical Feeder maintains the steady, even flow necessary for maximum production.

How second size of sand is obtained

Plaster or mason's sand can be produced by the addition of a second dehydrator to receive the overflow of water which carries such material from the first dehydrator. Recovery of this very fine sand results in additional profit to you and completely eliminates any waste. A water scalping tank can be added to the plant for maximum recovery of sand down to 200 mesh or finer. (See inset.)

Other important features

Maintenance costs are low, as all drives are simple. Individual electric motor drives on each unit mean fewer sprockets, shafts, gears, belts and chains to wear out.

Labor costs are low, as 2 operators can control entire plant. One regulates feeding, while the other checks material hauled away.

Additions and alterations are simple to make. Jaw or roll crushers can be added or omitted. Dehydrators and bins may be changed and other units such as a water scalping tank added to meet specific needs. Stockpiling conveyors can be added to handle any or all of the sizes produced.

Varying material specifications are easily met by simply changing screens.

Compact design. *This is a "package" plant, specifically designed to give you maximum plant at minimum cost.* Plant needs space of only 15' x 180'. This lets you set up plant close to pit or water supply.

Semi-portable. All units can be quickly dismantled, moved, and assembled with a crane and transported by truck or semi.

For further information, write Pioneer Engineering Works, Inc., Minneapolis 13, Minn. (subsidiary of Poor & Company, Chicago) or nearest PIONEER Distributor.

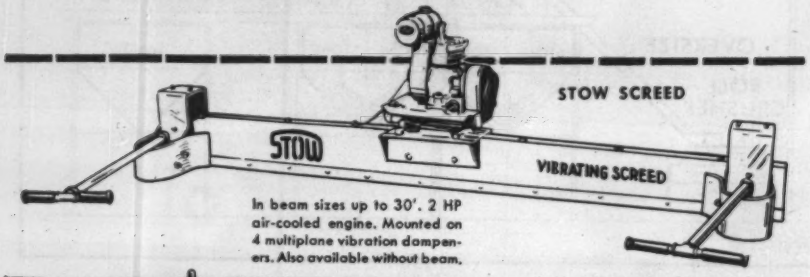
Pioneer *Continuflo* EQUIPMENT

Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn.
Subsidiary of Poor & Company • Chicago
Please send information on equipment checked.

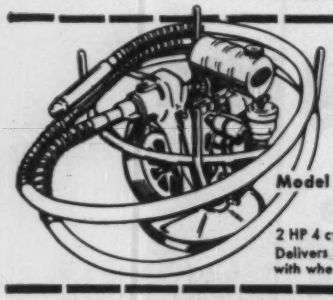
☐ GRAVEL PLANTS ☐ WASHING PLANTS ☐ MECHANICAL FEEDERS
☐ ROCK PLANTS ☐ BITUMINOUS PLANTS ☐ VIBRATING SCREENS
☐ JAW CRUSHERS ☐ APRON FEEDERS ☐ BUZZER SCREENS (LIGHT DUTY)
☐ ROLL CRUSHERS ☐ ORD FEEDERS ☐ CONTINUFLO CONVEYORS

*Name*_____
*Company*_____
*Address*_____
*City*_____ *Zone*___ *State*_____

Concrete facts about Concrete Vibrators and Screeds

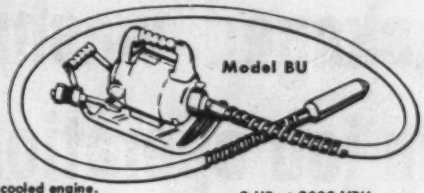


In beam sizes up to 30'. 2 HP air-cooled engine. Mounted on 4 multiplane vibration dampeners. Also available without beam.



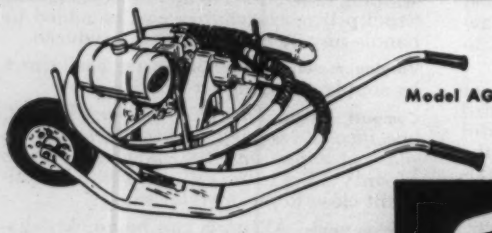
Model BG

2 HP 4 cycle air-cooled engine. Delivers 6000 to 9300 Available with wheelbarrow mount.



Model BU

2 HP at 9000 VPM 115 V. AC or DC



Model AGW

4½ HP 4 cycle air-cooled engine. Mounted on wheelbarrow for easy maneuverability. Delivers 6000-9300. Available without wheelbarrow.

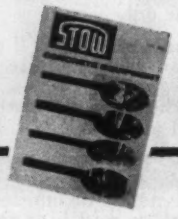
Here is the name you want!

STOW

The high operating speeds of the new STOW line of Concrete Vibrators make possible the use of heavy duty, light weight flexible shafting and lighter, more efficient vibrator heads—which speed operations, cut costs. And, STOW design provides convenient, practical speed control so *attachments may be used directly on the vibrator shafts.*

STOW SCREEDS—permit placing more than 300 cu. yds. in less than 8 hours; strike off and impact in one operation; leave surfaces true to grade; work up to and around manhole covers and obstructions.

See your STOW distributor about STOW vibrators and screeds today. Send for free Catalog 552.



STOW MANUFACTURING COMPANY
19 Shear Street Binghamton, New York

NEW PRODUCTS

Bolting Calibrator

Portable unit keeps bolt tensioning up to "specs"

Since the successful use of high strength bolts in structures depends largely on accurate tightening, it is important that a means of checking impact wrenches is available on the job. A new calibrator reportedly makes this possible while eliminating overstressing and stripping.

The calibrator is clamped to any convenient post or beam; bolt, washers and nut are then inserted in the unit. The nut is then tightened with the impact wrench and the tension in the bolt is read on a hydraulic gage. Air pressure and tightening time are then modified until the proper tension is obtained and this pressure and time are used in tightening the bolts in the actual structure.

According to the manufacturer, since the tension in the bolt acts directly on the unit's hydraulic components, there is no error due to cocking, friction or misalignment.

The device calibrates wrenches for ¾, ⅞ and 1-in. bolts that are 2½ in. long or longer.

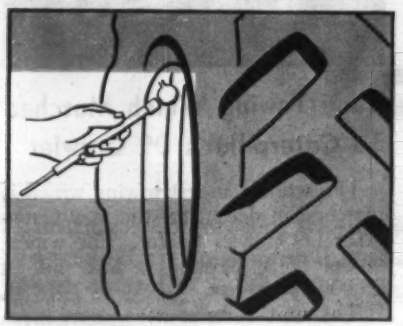
The calibrator weighs 50 lb and measures 12 x 14 x 5 in. and is a self-contained unit. Thus the unit can be mounted at or very near the point of erection rather than calibrating at one place and tightening at another where conditions might vary.

Price of the calibrator is $315 fob Cleveland with a carrying case. Skidmore-Wilhelm Mfg. Co., 442 Green Road, Cleveland, Ohio.

How to Get MORE Out of Your Tires

The tires on your earthmoving equipment deserve as good care as the tires on your automobile. By keeping them in proper working condition, you cut repair costs, prevent unnecessary down time, promote greater safety, and get more profitable hours of work from your tire investment.

Remind your operators and maintenance men to follow these simple suggestions:



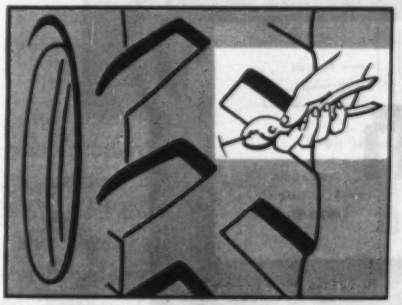
Check pressures regularly

Measure the tire air pressure every day if you're on a two or three-shift job, every other day if you're working one shift. Use the pressures recommended in the operator's manuals for your machines. It's a good idea to always check tires at same time of day and under uniform conditions of internal heating from tire travel. Do not bleed tires whose pressure has increased *normally* because of heat from friction or rise in air temperature. If a tire loses five or more pounds of air during 24 hours for several days and if the weather hasn't changed much, do not just re-inflate. Check first for the cause of the excessive loss . . . you may have a slow leak.

While checking pressures, clean mud and dirt from around exposed valves. Wipe off excess oil from tires, oil causes rubber to rot rapidly.

Under, rather than over-inflate

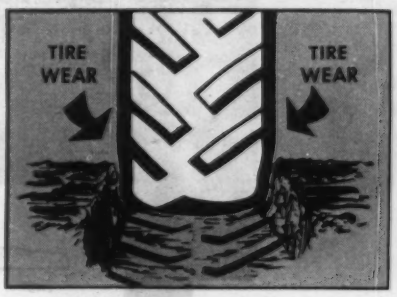
Soft pits and fills call for tire pressures in the low range. Well-maintained, hard haul roads demand higher pressures. Where both conditions occur on the same job, use your best judgment to split the difference. Whenever you are in doubt, remember to keep tire pressures toward the minimum range. More trouble has been caused in off-road service by over-inflation than by under-inflation. On very rocky ground, it is good policy to reduce load and to reduce speeds. This helps protect tires from damage, helps move more yardage.



Inspect tire treads regularly

Pick out nails, glass, stones, anything that can cut the rubber. Look for gashes, gaps or bulges. If cuts come close to the cords, pull off tire at once and vulcanize to close gap. Don't wait until tire blows, or gets too bad to hold repair . . . you may get a flat a long way from the shop, costing time and trouble . . . and costing you a lot of good miles on the old tire.

Don't put a boot in a casing that is worth repairing. A boot should be used only to get a few more days' service from a tire not worth fixing. If a boot is used longer than that, it wears the casing and may cause a blowout.



Keep work areas clean, level

When starting work in a field grown with grass and weeds, it's a good idea to walk over the working area, removing broken bottles, barbed wire and similar tire hazards.

If a grader does not patrol haul roads regularly, drop scraper pan every few return trips to level ruts, clear road of sharp stones and spillage. Deep ruts tend to wear side walls. Where units are working in rooted or blasted material, go around the big, sharp fragments.

Don't let your operators spin wheels in fast starts. Don't let them skid to screeching halts. In the borrow and on the fill, start and stop sensibly. It's safer and will get more work from your equipment.

For free reprints of the advertisement, write LeTourneau-Westinghouse Company, Peoria, Illinois. Please state quantity desired.

G-773-OP-bw

LeTourneau-WESTINGHOUSE Company
Peoria, Illinois
A Subsidiary of Westinghouse Air Brake Company

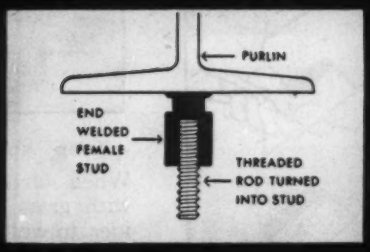
"STUD" NELSON HANGS A

FIXTURE

IN A FLASH!

Watch a contractor go to town with the NELWELD® system, hanging electrical fixtures, securing conduit and cable runs, clamping pipes, and fastening sprinkler heads. You'll see split-second end-welding of female studs, standard threaded studs, shoulder types and eye bolts with the bantam-weight NELWELD gun.

In a flash the stud becomes an integral part of the structure and in minutes the installation is complete.



Call in your NELSON Fastening Engineer for consultation. His specialty is cost reduction; his stock in trade, stud welding. Write for details—Bulletin 450.1.

Stud Nelson

Fasten it Better at Less Cost with

NELWELD®

NELSON STUD WELDING
2741 Toledo Avenue
Lorain, Ohio

Please send more information on hanging electrical apparatus and other cost-saving applications.

NAME_____

COMPANY_____

ADDRESS_____

CITY AND STATE_____

NELSON STUD WELDING DIV OF GREGORY INDUSTRIES, INC **LORAIN, OHIO**

NEW PRODUCTS

Huge Towing Winch Matched To Caterpillar's D9 Crawler

The world's largest towing winch is matched in design for the new Caterpillar D9 crawler tractor. The winch, model D9A, develops a line pull of 76,000 lb.

The unit features a constant mesh transmission, flexible cable controls, built-in drawbar, cast alloy-steel drum, 15-in. brake, hardened gears throughout and brake compartment sump. Net weight is about 3,250 lb. Barrel diameter of the drum is 16 in., flange diameter is 27 in. and barrel length 11 in. The cable capacity is 269 ft of 1⅛-in. line or 217 ft of 1¼-in. line.

The D9A winch is available in two versions, one for the direct drive Caterpillar tractor, the other with alternative intermediate gear train to suit the D9 torque converter model. HYSTER CO., 2902 N.E. CLACKAMAS ST., PORTLAND 8, ORE.

Snap-on Roller Bearing for Chain Saws Increases Power

A new snap-on roller bearing nose guide for use on any chain saw, by free-wheeling the chain, is said to produce up to 20% more usable cutting horsepower.

The roller bearing literally is simply pressed into the slot that is machined into the nose of the guide bar. And it can be removed by a light tap of a hammer on a block of wood pressed against the bottom edge of the bearing's flange.

Any bar shop or machine shop can machine any make of guide bar to receive the roller bearing. A template for machining the bar is supplied with each snap-on roller bearing. The bearing is available in 2½ and 3½-in. sizes for use on bars up to 54 in. MALL TOOL COMPANY, 7725 SOUTH CHICAGO AVENUE, CHICAGO 19, ILLINOIS.

TOURNAPULLS buck blizzard to open gravel pit

Chenango Corporation, North Syracuse, New York, stripping gravel on a rush job, worked their 2 rubber-tired electric-control D Tournapulls straight through a blizzard to complete the task.

Despite the slippery footing, and wet material, each "D" was push-loaded with 5½ bank yards of gravelly topsoil in 25 to 50 seconds. Spread was made in 10 to 15 seconds on worked-out section of pit to reclaim it for farming. Complete 1260′ cycles took less than 3 minutes. The 2 "D's" together delivered 36 loads (198 bank yards) per 50-minute hour.

Chenango handles all kinds of work with these two 7-yard Tournapulls. For example, building an apron at the Syracuse Airport, they handled precision grading. On another job, where fill had to be spread inside steel Butler buildings, "D's" drove inside, dumped, and drove out. Rebuilding a golf course, the Tournapulls self-loaded peat moss from a swamp and spread around greens. They have built conservation stockponds and dams, graded town and village secondary roads, and leveled for subdivisions and schools. One time, they even excavated for a garage next to an existing building.

Units usually load without a pusher and, with their big tires, provide necessary compaction. Job-to-job moves are made under own power . . . longest moves of 20 miles usually take less than an hour.

Chenango President R. B. Hazard says, "We like the D Tournapull for our type of work."

If 28 mph speed between jobs, plus all-weather workability interests you, give us a ring. We'll be glad to show the Tournapull in action on your job so you can judge its advantages for yourself.

Tournapull—Trademark Reg. U.S. Pat. Off. DP-613-S-b

Even snow and cold, rain and heat, do not lower the efficiency of Tournapull's 4-wheel air brakes. Unit went up and down 8% grades on this job, and through traffic, with complete safety.

Insure your future

For less than 25% of the cost of the original unit, scraper interchanges with 9-ton hauler for rock and other shovel work. All you need is rear-dump body . . . rear wheels, tires and brakes can be used on either haul unit. Prime-mover also powers interchangeable crane, flatbed and logging arch. Front end can be equipped with 8′ bulldozer or 9′ V-type snow plow for even greater versatility.

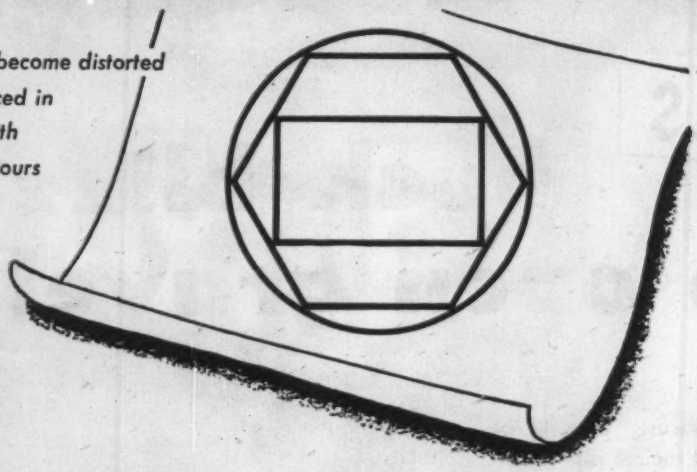
LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

The Strange Case of the DISTORTION of CONTOURS

Contours become distorted when placed in contact with other contours



Arkwright Tracing Cloth Produces Contours in Clear, Clean Lines

ARCHITECTS, ENGINEERS, DESIGNERS AND DRAFTSMEN are placing great projects on Arkwright because of these three important qualities:

1. SPEEDIER DRAFTING — Arkwright withstands repeated erasure and re-inking without feathering. Its exceptional finish is free of pin holes and thick threads which cause blobbing.
2. LONGER LIFE — Arkwright's special mechanical method of obtaining greater transparency eliminates opacity and brittleness. Its finish guards against fraying, tearing and curling.
3. SHARPER PRINTS — Arkwright's high transparency means clean, sharp reproduction, exceptional for detail work.

WRITE FOR FREE SAMPLES. See why, throughout America, more Arkwright made tracing cloth is sold than all other domestic makes combined. Use the rolls with the blue line that identifies "America's Standard." Arkwright Finishing Co., Industrial National Bank Building, Providence, R. I.

ARKWRIGHT
Tracing Cloths
AMERICA'S STANDARD FOR OVER 34 YEARS

NEW PRODUCTS

Forward-Tipping Bucket Broadens Loader's Utility

A new forward-tipping bucket permits the Holmes-Owen truck loader to be used as a loading unit for other trucks. The bucket was designed and developed to perform two functions: First, to improve digging and shoveling operations when the unit is used for self-loading; second, to permit the equipment to be used for loading other vehicles.

The bucket is hydraulically operated by controls which are located inside the cab, on the steering column. The bucket is constructed with a pivot at each end, near the center of gravity. These pivots are mounted in bearings which are at the end of each arm, thus allowing the bucket to rotate. The bucket is powered by two double-acting cylinders mounted on the top side of each bucket arm with the piston rods connected to bell cranks mounted on the bucket operating shaft.

The bucket may be rotated to any position up to 120 deg. so that the operator can lower the digging edge of the bucket when necessary for getting a better bite into the material, or may be rotated for better filling of the bucket before dumping.

The unit has a ½-yd capacity and can be installed on most 1½ to 2-ton trucks with any standard type dump body. Ernest Holmes Co., Chattanooga, Tenn.

Two-Level Wiring System Allows Greater Flexibility

A new steel underfloor wiring system, designed for commercial, industrial, and institutional buildings, consists of two levels of steel ducts with necessary fittings. The lower level of duct is used to feed conductors from panel boxes to the upper level which in turn distributes conductors to the surface outlets. The design makes possible considerable flexibility in layout of underfloor distribution systems.

This system provides for complete separation of high and low-tension services because only single-duct junction boxes are used throughout. The box has duct entrances on two levels, and the design permits unobstructed runs without the necessity for special crossunders or crossovers.

Although this system has just been announced, it has already been specified for two new large office buildings in New York. Construction Materials Div., General Electric Co., Bridgeport, Conn.

Shortcuts to quicker, lower cost compaction

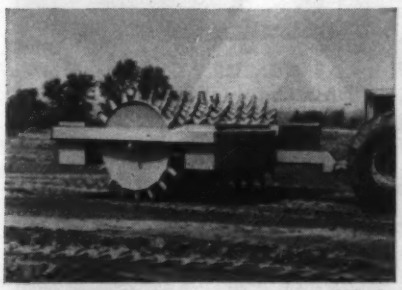
Earth swells when excavated. This "swell" varies from a low of 5 to 15% in sand or gravel, to a high of 30 to 62% in clay. When put into the fill, earth must usually be packed down to somewhere near its original volume.

Modern rubber-tired, self-propelled dirtmovers can help you achieve compaction results quicker and at lower cost. To help you meet compaction standards quicker and easier, here are some shortcuts:

1. Spread "on the run". Best spreading results are obtained when travel is at speeds corresponding to the rate of material flow from the scraper. Spread should be made within a distance of 65 to 100 feet and be completed in 30 seconds or less. This insures uniformity.

2. Build up your fill in thin, uniform layers 4 to 12 inches thick. The thinner the fill is laid down the easier it is to compact.

3. Blade the fill with a bulldozer or motor patrol. If neither of these tools is available, your self-propelled scraper can do double duty. Drop your blade with apron closed on every third or fourth return trip and level the fill. Your scraper will do almost as good a job of blading as a motor patrol.



Sheepsfoot Rollers with external ballast boxes and provision for drum loading have a wide range of foot pressures to meet various soil and compaction conditions.

Compaction during normal travel across the fill is one of the bonuses you get at no extra cost with rubber-tired dirtmoving equipment.

The Sheepsfoot Roller is the most popular compacting tool, although rubber-tired and vibrating tampers are sometimes used. Before you begin to haul across a fill, be sure the earth is moist enough to pack. Sprinkle if necessary. A correctly designed Sheepsfoot will work the layers together and mix the water into the ground better than any other compactor.

A Sheepsfoot Roller seldom "walks" completely out of the foot depressions. It leaves the top 2 to 5 inches in a loose binder layer which is compacted at the bottom of the next lift. When the roller does "walk" out completely, loosen the surface with a disc harrow to maintain a good bond between lifts.

By carefully routing your self-propelled scrapers or rubber-tired tractors across the fill, you speed up compaction. Rolling action of the broad, low-pressure tires tends to confine and compact the soil under the tread rather than displace it. In its normal travel across the fill, the big rubber tires of modern earthmoving equipment may give as high as 80 to 85% of specified compaction. This is important as the fill nears completion, because rubber-tired machines will pack the top 2 or 3 inches that remain loose behind the Sheepsfoot Roller.

Success or failure of roads, airports and other structures built of earth depends on the condition of the fill. Proper compaction permits surfacing materials to be placed immediately and accurately. It helps make the fill watertight and allows it to carry heavier loads. If properly tracked on the fill, man-high 2-foot wide earthmover tires do an excellent job, often comparable to special compaction tools. Specified or not, compact every fill whenever possible. You'll do a better job of dirtmoving than the other fellow!

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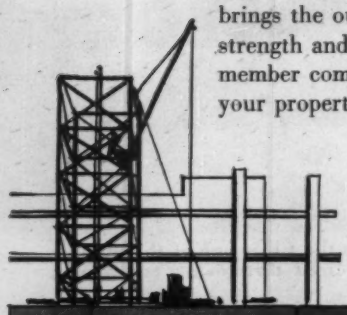

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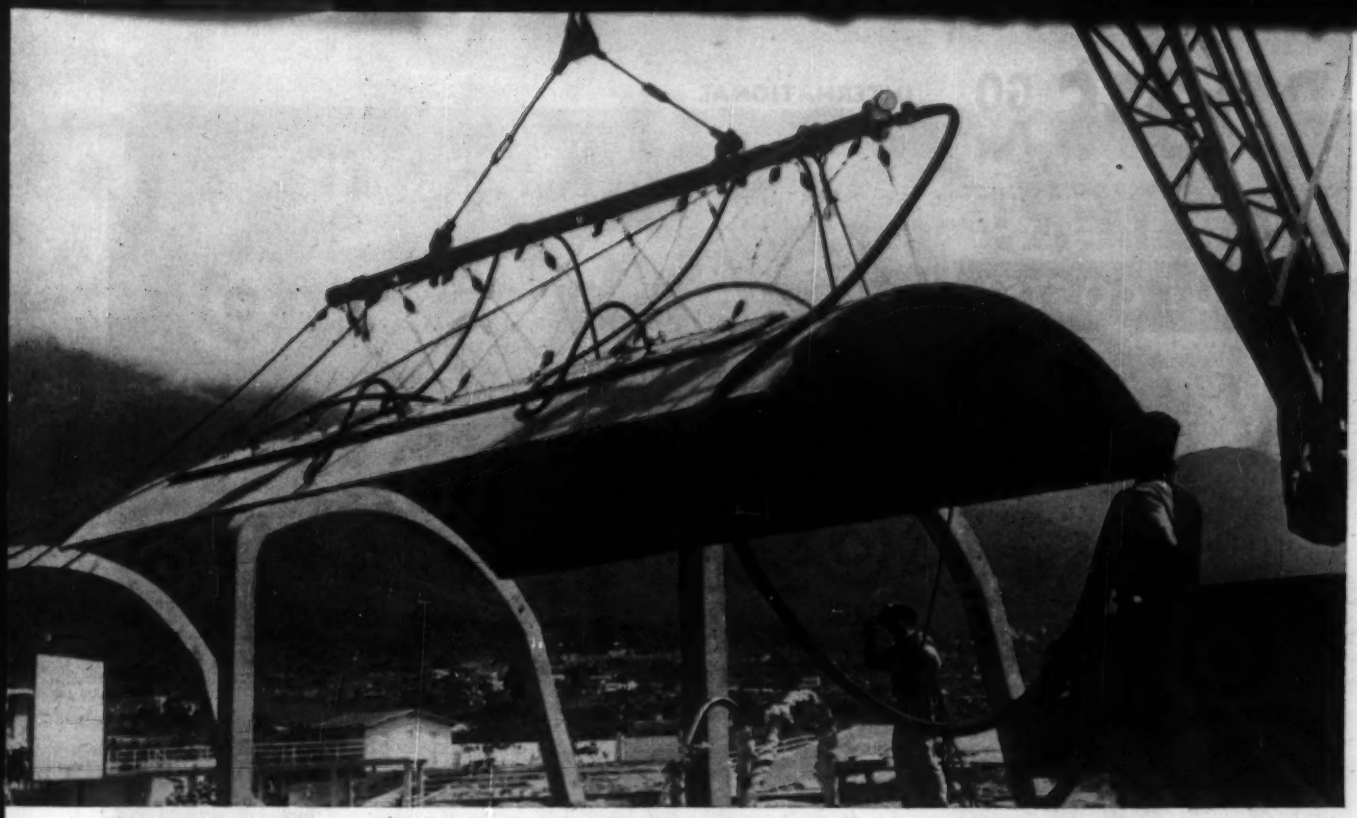

Vacuum Lifter was specially designed to handle the 1½-in. thick roof panels without introducing bending moments or point stresses. The spreader is a 6-in. pipe which acts as both a vacuum reservoir and a ridge beam for the equalizer rigging.

RIGID FRAME MEMBERS were precast and installed on prepared footings.

CURVED ROOF SECTIONS were cast one on top of the other on a single form. Low slump concrete and warm weather permitted two pours per day. Note curved rods.

Thin-Shell Roof Makes Erection Speedy

From footing to roof in 15 days—that's what happened when the contractor used precast frames and thin-shell roof panels to build cabanas at a new resort hotel in Caracas, Venezuela.

The curved roof sections were precast at the rate of two a day and were erected by a special vacuum lifter which gave temporary support to the thin members during stripping and final placement on the precast frame supports.

For continuity, the longitudinal reinforcing bars, curved to take the principal stresses, were left protruding about 2 in. and were welded to the bars of adjacent panels after erection. The 2-in. joints were packed with grout after welding. Nine sections, 20x15 ft and 1½ in. thick, were erected and joined in eight hours.

One feature of the design is that the Ortega-Billner roof panels function as a curved beam, not as an arch, since they are supported only at each end by the rigid frames. There are no longitudinal supports.

The contractor was Vacuum Concrete de Venezuela, C. A. of Caracas.

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High Air and Long Car Speed Tunneling

An extra long shuttle car and increased air pressure to the drills accounted for a tunneling speed record in North Scotland.

The tunnel is only 8 ft high by 6½ ft wide and had to be driven through granite. This small section, and the nature of the rock, made a pull of much more than 7 to 8 ft per cycle unlikely, but it was decided, despite these somewhat unfavorable conditions, to attempt a high speed face advance.

Attention was directed to the drilling and mucking parts of the cycle which take a high proportion of the total cycle time. Air pressure was substantially increased from a normal 80 psi or so to 115 psi at the face. The rock drill is already a highly-stressed piece of equipment but it was decided that the risk of premature breakages was worth taking.

Three machines were employed to drill the average 21-hole pattern with another three standbys used in rotation. At the completion of the tunnel each had drilled approximately 30,000 ft and spares consumption was no more than usual with any rock drill at normal air pressure.

Tungsten carbide tipped steels of ⅞ in. hexagon section with 1½ in. diameter bits were employed. To avoid loss of time in changing, 8-ft steels were used. The severe combination of hard rock and heavy blow with vibration of the long unsupported rod resulted in high fatigue stresses, tending to shorten the life of the steels, but a check near the end of the work indicated that the average life was then about 300 ft which, under the circumstances, was considered to be good.

It was found that the 8-ft holes could be consistently drilled in just over four minutes, and the overall drilling speeds—including time for moving from hole to hole—were 18 to 20 in. per minute throughout the work. Total drilling time was thus cut to under 35 min per cycle.

Broken rock was loaded out with a rocker shovel. The tunnel size was about the minimum for the machine and the loading rate was high, particularly with the increased air pressure, but overall speeds are dictated largely by the facilities for removing spoil from behind it. The width of tunnel here prevented any possibility of fast car-changing, and it was felt that any of the usual methods of car-changing result in more loss of time than is generally recognized. It was expected that the special shuttle car would ensure continuous loading out.

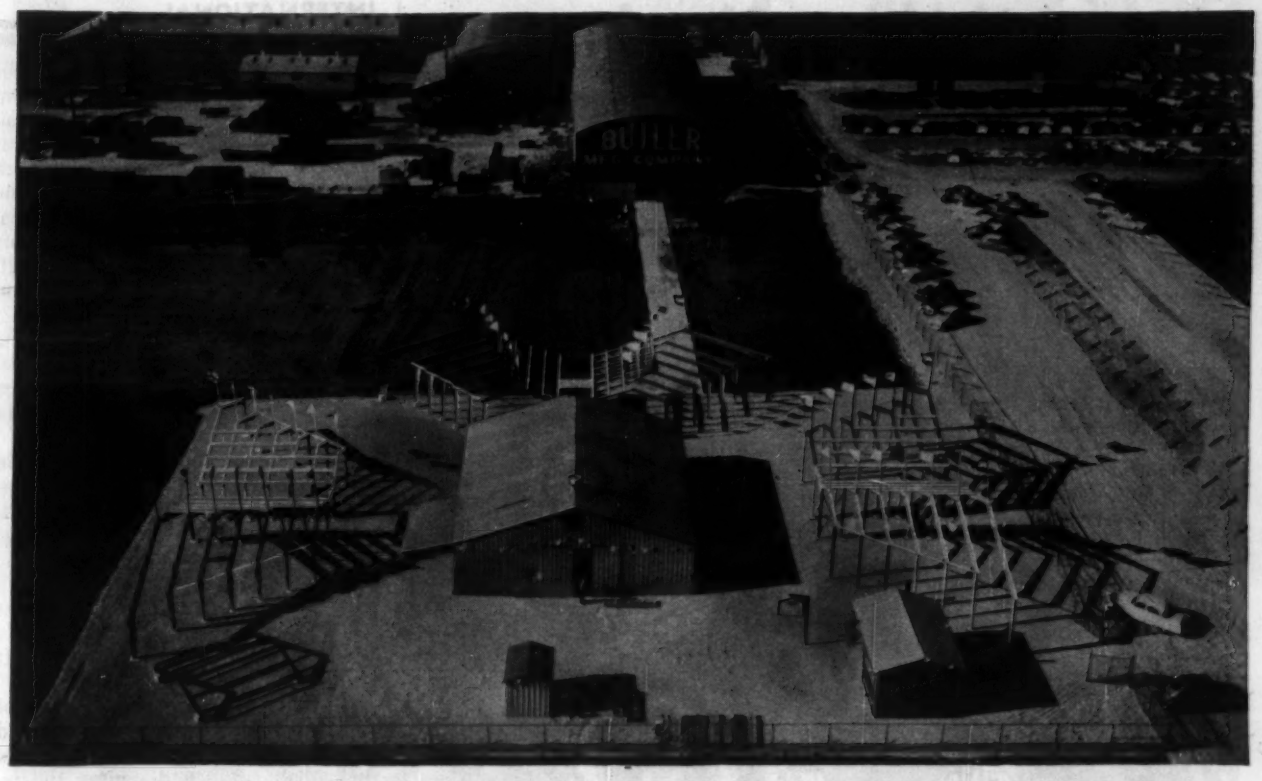
General arrangement of this car provided for a main frame 70 ft long carried on two eight-wheel bogies. The chassis is supported on stub-axles integral with the bogie frame.

The floor of the body consists of a steel slat conveyor-belt on rollers, propelled by hydraulic rams. The loaded rock is thus moved steadily back as required to make room for the new fill.

Some doubt was felt as to the amount of friction which might occur between the stationary side plates and the moving belt but a half-scale model indicated that these fears were groundless. Only a moderate pull was required on the belt of the full-size car and rock movement was entirely satisfactory.

The load was discharged through a space at the bottom of the car at the rear into cars of 2 cu yd capacity.

Satisfactory working of the car was not achieved without various delays and modifications. All work on the site was carried out at the tunnel portal on the crowded and exposed shelf, located on a steep hillside. Once,



Helicopter's eye-view of Butler's new building display at Galesburg, Illinois plant. Central building incorporates engineering refinements. Surrounding forest of rigid frames demonstrates variety of widths, side-wall heights, and code-complying structurals now available up to fifty feet wide (wider rigid frames are also available but not shown).

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during a gale, the car, weighing about 12 tons, was blown sideways from some timber balks on which it had been placed. Conditions were thus far from ideal for experimental work of this kind and a great part of the tunnel had to be driven by normal loading-out methods, using small cars and passing-bays. In spite of the difficulties of this system good performances were recorded.

Mucking times before and after the introduction of the special car make an interesting comparison. The best time of about 80 min was reduced to 40 for the same depth of pull.

The behaviour of such a large car on the track inside the tunnel was a possible source of trouble. No special care was taken in laying the 2-ft gage track of 30-lb rails, but running on the carefully designed bogies proved to be very smooth at speeds up to about 8 mph both loaded and empty. Curves of a minimum radius of about 120 ft could be negotiated.

Towing was by a modified version of the 38-hp diesel locomotive, supplied by F. C. Hibberd & Co., Ltd., who also collaborated in designing the remote controls which could be operated from the loading end of the car—70 ft away. This system proved satisfactory. Hydraulic power for the conveyor belt was taken from an engine-driven pump incorporated in the locomotive.

Still further time was saved by the high capacity of the ventilation system. The supply was stepped-up to the exceptional figure, for this face area, of 7,500 cfm.

Two blowers of 35 and 85 hp were used. Both were run to clear gas after blasting and during the mucking period; re-entry to an entirely smoke-free face was possible within 10 min after firing. Diesel fumes were also rapidly cleared by this system.

By the time the shuttle-car was in regular service, cycle times were so short that an attempt was made at an optimum figure for a working week. During one seven-day period 67 cycles were completed, despite loss of more than a shift on rectifying minor faults on the car. In that period the tunnel was driven 444 ft. It is thought that had the tunnel not been almost finished, further improvement could have been reasonably expected.

The experimental method was used by Marples, Ridgway & Partners, Ltd. of London, engineering contractors, at the Allt-na-Lairige tunnel in Argyll, Scotland. The 6,600-ft tunnel is part of a hydro-electric system being built by the North of Scotland Hydro Electric Board.

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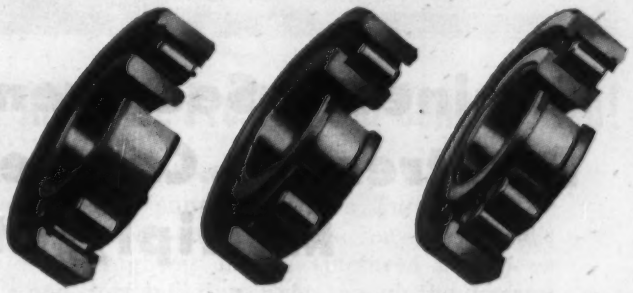
Tru-Rol Bearings with crowned rollers are available in 3 types

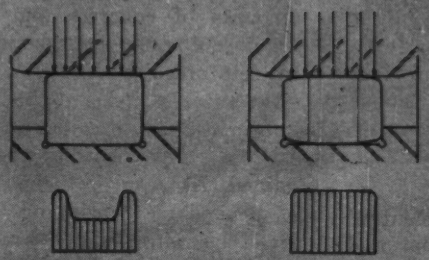


Stamped Steel Retainer with Guide Lips

Segmented Steel Retainer

Full Roller

Comparative Stress Patterns under Uniform Loads for Straight and Crowned Cylindrical Rollers



Stress pattern for a straight cylindrical roller under load. Note uneven end-loading.

Stress pattern for crowned roller under load. Crowning radius is exaggerated for clarity.

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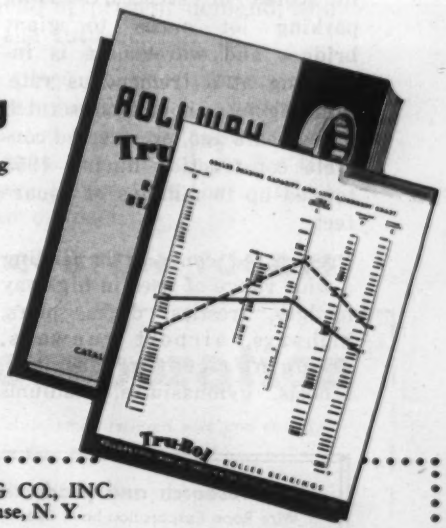

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Engineers See Tremendous Future for Prestressed Concrete as Present Uses Multiply at Fast Pace

The use of prestressed concrete in scores of structures from parking lot curbs to giant bridges and warehouses is increasing at a tremendous rate. Starting just about from scratch a few years ago, prestressed concrete construction during 1955 totaled up to millions of square feet.

Prestressed concrete is finding a wide range of uses in highway bridges, trestles, docks, piers, highways, airport runways, shopping center facilities, schools, gymnasiums, stadiums and a rapidly growing list of residential, commercial and industrial buildings. A look at the "small item" end of the list turns up such products as movable curbs for parking areas, light poles and sign standards, fence posts, and many another product to suggest the field of uses is about as unlimited as the imagination of engineers and business men.

Advances in the development of better high tensile strand and wire for tensioning the concrete are in large part responsible for this trend to prestressed construction. Architects and engineers have known for a long time they could apply this principle and save substantial amounts of concrete and steel required for the same structure in reinforced concrete. Longer spans, less deadweight, and lighter foundations were some of the specific benefits to be gained. As soon as the problem of dependable tensioning materials was whipped, the way was opened wide to the present boom in prestressed construction.

The research and production facilities of Union Wire Rope Corporation have been geared to the seven-league strides of prestressed construction since the trend began shaping up some ten years ago. Our expanding plant capacity and central location in Mid-America have made us the ideal source of supply for the strand and wire that form the "tendons" of prestressed concrete.

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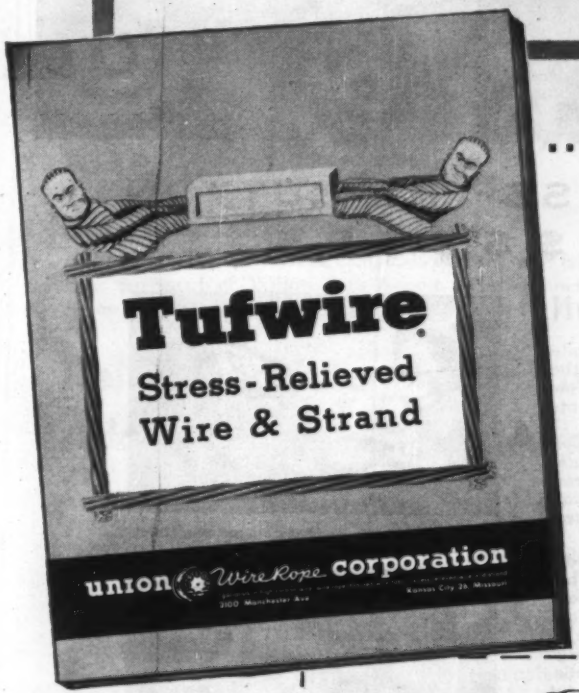

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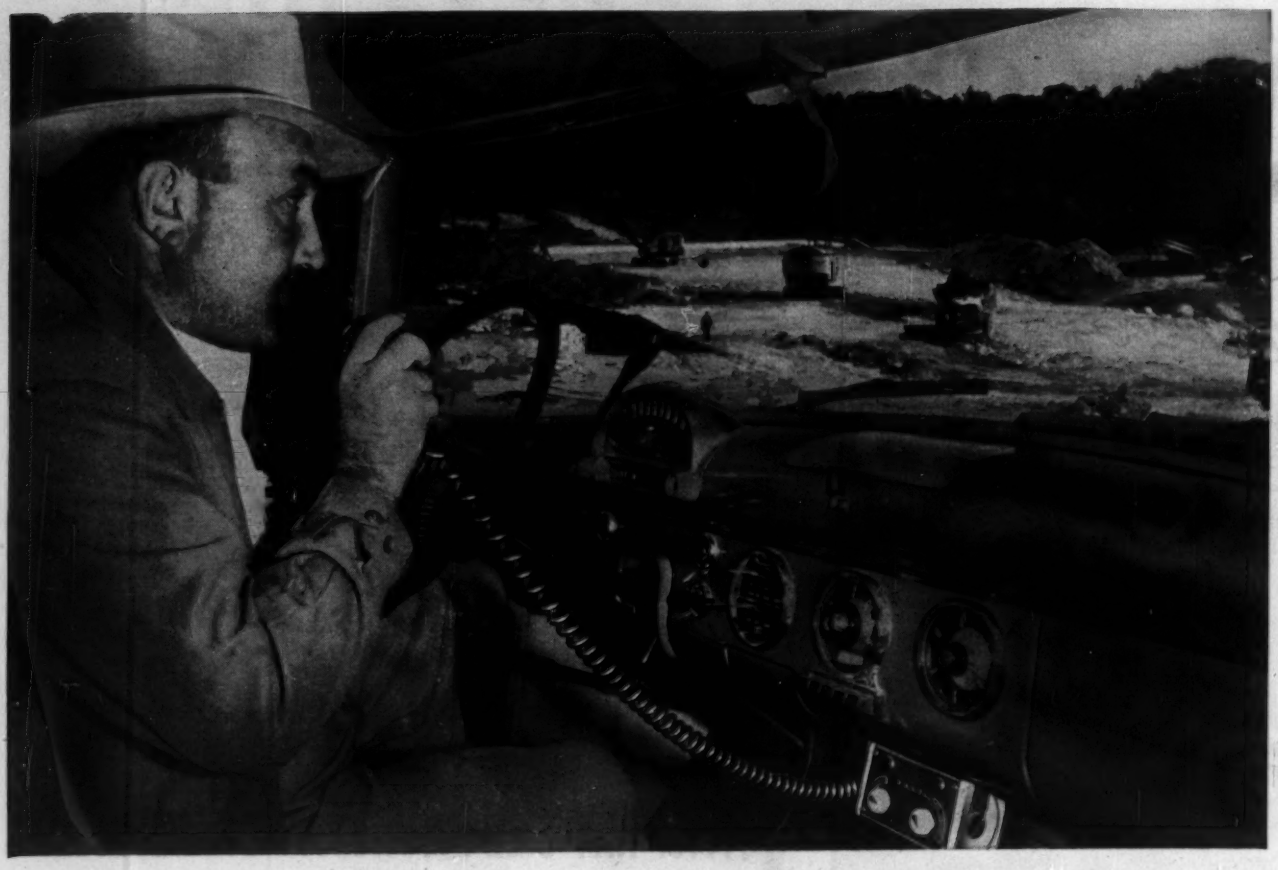

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. . . and 15 minutes saving for every call

Key to a savings of many dollars each day are the Motorola mobile 2-way radio units in cars and pick-up trucks used by personnel of the Yonkers Contracting Co. in the construction of sections of the New York State Thruway. Every time one of the engineers, superintendents or foremen presses the button and talks, he saves a *minimum* of 15 minutes—in time required to travel to another site to: *find equipment needed elsewhere—find a mechanic to make repairs on a truck—make arrangements for the next day's work—hold a conference—report unexpected trouble—ask for fill—locate project manager, chief engineer or coordinating superintendent—ask the main office to rent another piece of equipment or purchase parts not in stock.*

But 15 minutes saved per call is only the minimum. Over the radio "party-line" it is possible to get the answers and make decisions that would have taken hours otherwise. In brief, there are as many reasons to use 2-way radio as there are questions to be answered each day, shifts to be made in personnel or equipment, and "emergencies" to be handled without delay. Yonkers Contracting Co. personnel average between 200 and 300 calls per day. It's easy to see why Arthur Cipolla, chief engineer, says that they don't know what they would do without 2-way radio, that they have forgotten what it was like to supervise a large construction job without this modern form of communication.

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APPLYING THE BINDER COURSE over the wire fabric laid on top of the old concrete pavement of Willow Run Airport. The channel chained to side of the paver (arrow) is one of the devices used to hold down the fabric as the paver passes over it.

Reinforced Bituminous Surfacing Added to Willow Run Airport

As part of the pavement research program of the University of Michigan, 70,000 sq yd of the old concrete pavement on the Willow Run Airport in Michigan have been resurfaced with bituminous material reinforced with welded wire fabric. The university owns the airport and leases it to the Airlines National Terminal Service Co.

Current plans for this airport call for annual increments of resurfacing, depending on future developments. In this way the engineers in charge of the work for the university propose to keep well ahead of pavement deterioration and avoid excessive surface maintenance which develops from cracks and joints.

By preserving the structural integrity of the original pavement, the engineers expect to extend its life indefinitely. They look on the cracking of a concrete pavement as a conditioning process necessary to its effective performance up to a certain point. If the subgrade then is capable of carrying the load, there should be no limit to the life of the pavement.

Willow Run Airport was built by the Defense Plant Corp. in the early years of World War II. Its original pavement was portland-cement concrete, 6 to 8 in. thick, and was not reinforced due to the shortage of steel. This and other known deficiencies in construction, combined with the heavier plane loads of recent years, had produced an advanced cracking pattern in many of the 10x25-ft slabs in certain sections. Some of these cracked slabs were replaced before resurfacing was started.

Resurfacing has been applied to the half-mile-long center taxiway and to the 3,500-ft-long west ramp. Most of this new surfacing consists of a 2-in. thick binder course, reinforced with wire fabric over the old pavement, and a 1-in. wearing course of bituminous concrete. There are, however, two sections that have been laid without the wire reinforcing as a check on the effectiveness of the fabric in controlling reflective cracking over cracks in the old pavement. One of these is 400 ft long and has the same thickness of bituminous concrete while the second, 575 ft long, has had the surfacing thickness increased to 4 in.

The mix proportions of the binder course consists of 69.1% crushed stone having a maximum size of 1¼ in.; 26.0% sand, and 4.9% of 120-150 penetration asphalt cement. The surfacing course had the following approximate composition: 55% crushed stone (½ in. nominal top size), 34% sand, 5.5% mineral filler (passing No. 200 sieve), and 5.5% of 120-150 penetration asphalt cement.

The reinforcing fabric is made of No. 10 gage wire, with the wires spaced 6-in. apart lengthwise of the runway and 3-in. transversely. The sheets are 8 ft long and 9½ ft wide. and are spaced 6-in. apart transversely and so placed that the joints in the old pavement are under the centers of the sheets.

Longitudinally, the sheets were lapped away from the direction of travel of the pavers and fastened together with hog rings, also the cross-wires were put down against the old pavement to minimize the danger of snagging on the paver.

As in previous operations of this kind, the contractor attached "hold-down" skids to the paver to flatten out the fabric under the front end. The novelty in these hold-down skids was that they were turned up slightly at each end, instead of just at the forward end and were chained to the paver at both ends, thus increasing the mobility of the paver in turning.

Another departure from earlier practice in reinforcing bituminous paving was that of laying out the sheets of fabric well in advance of the pavers and spraying the old pavement with a quick-setting asphalt emulsion tack coat after the sheets were down. Heretofore the tack coat had been applied before the sheets were laid and the sheets were not put down until the paver was near in the fear that trucks serving the paver would distort the sheets. No distortion occurred on this project, and placing of the sheets was greatly facilitated.

This resurfacing work was done under the direction of Brewer Engineering of Owosso, Mich., repre-

A CONSTRUCTION WALL is no stronger than its weakest segment. Ruined foundations commence their deterioration when dampness, moisture or water penetrate weakened areas. Once breached, a poorly waterproofed wall soon becomes a serious and expensive problem. Contractor reputations are injured when water damage occurs.

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When you insist on *IRONITE* Waterproofing you get STRUCTURAL INTEGRATION in the wall. Once applied, removal is impossible without destruction of the underlying concrete or masonry.

For almost half a century, as a means of protecting their reputations for excellence, leading architects, engineers and contractors have specified IRONITE Waterproofing for all types of construction projects including:

Foundations	Molasses Tanks
Basements	Hot Water Tanks
Catch Basins	Fuel Oil Tanks
Boiler Pits	Settling Basins
Elevator Pits	Tunnels
Concrete Bridges	Bank Vaults
Swimming Pools	Oil Tanks
Cable Vaults	Water Tanks
Concrete Fences	Sewage Disposal Plants

For further information on IRONITE WATERPROOFING write for your free copy of Bulletin No. 701 to: IRONITE COMPANY, Suite 729, 208 South LaSalle Street, Chicago 4, Illinois.

IRONITE COMPANY

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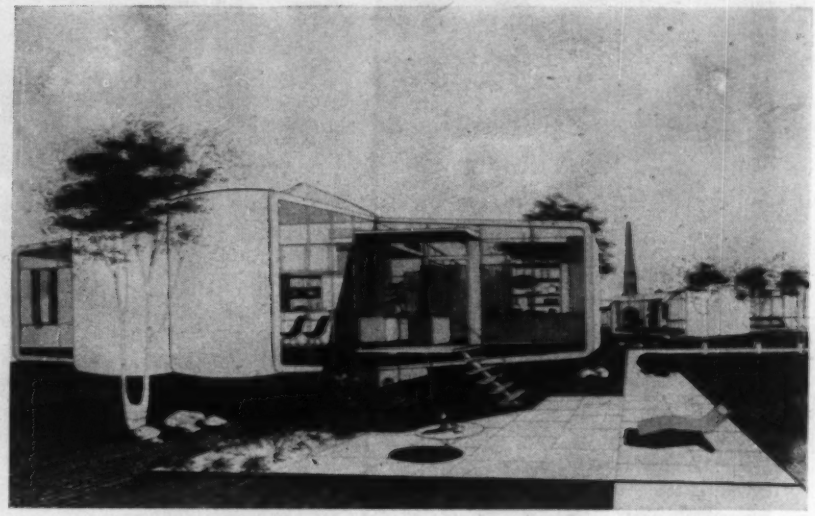
senting the University of Michigan, with Prof. William S. Housel also representing the university's interest. The Howell Construction Co. of Howell, Mich. was the contractor. The Civil Aeronautics Administration put up half of the $160,000 cost, and the university and the Michigan State Department of Aeronautics provided $40,000 each.

Pipe Is Extruded in Place

Of major interest to those looking for faster ways of laying pipe is a new development of Bjorksten Research Laboratories, Madison, Wis. A plastic pipe extruder placed on a tractor now makes it possible to extrude and place plastic pipe at the same time, and at rates of several miles per hour.



FUTURE PLASTIC HOUSE in its most basic plan has four pairs of 8-by-16-ft-modular sections cantilevered out from a central utility core.

Plastic Home of the Future

A preliminary design for a plastic "house of tomorrow" has been disclosed by the Monsanto Chemical Co.

The basis of the design is a molded module, 8 x 16 ft, which is bent to form ceiling, wall, and floor. In the simplest plan, eight molded modules are cantilevered in pairs from a 16-ft-square central utility core to form four 16-ft-square rooms. The central core houses baths, kitchen, laundry and heating facilities.

By merely juggling the design components of the plastic dwelling, it is possible to arrive at a variety of floor plans, including twin cores. The problem of the changing space needs of a family is solved by adding or removing rooms. Since the floors of the rooms are cantilevered out over the ground, the amount of site excavation required for the units is a minimum.

In addition, many of the structural and decorative features of the new home will also incorporate plastics. Some of these are: Counter tops, walls, table tops, movable partitions, windows, gaskets, conduits, ducts, piping and insulation.

The design continues to be developed at Massachusetts Institute of Technology by architect Marvin Goody and research associate Richard W. Hamilton who is also director of the Monsanto-sponsored research project.

Rutgers Highway Researchers To Study Frost Penetration

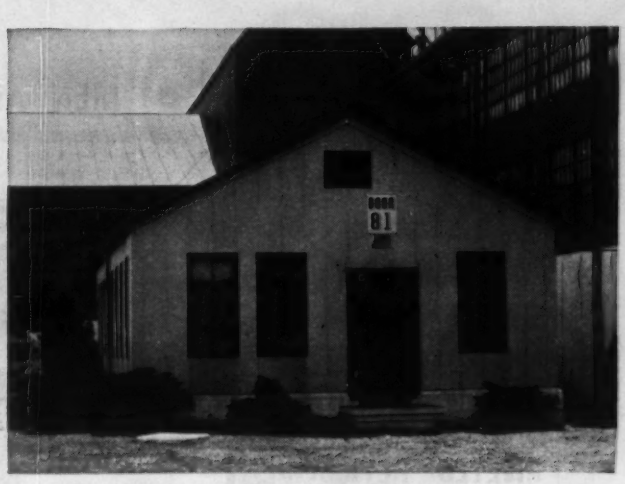
The National Science Foundation has made a $22,700 grant to Rutgers University for a study of frost penetration effects on highway construction.

The program will be headed by Prof. Alfreds R. Jumikis of the College of Engineering, who has directed the Joint Highway Research Project at Rutgers since 1952.

In laboratories equipped to simulate field conditions, Prof. Jumikis and his graduate assistants will attempt to develop data that can be used in the design of proper base and sub-base layers beneath pavement. They will study methods for predicting frost penetration in various soils by determining cause and magnitude of the force pulling moisture from ground water zones to frozen zones.

Work will begin in February.

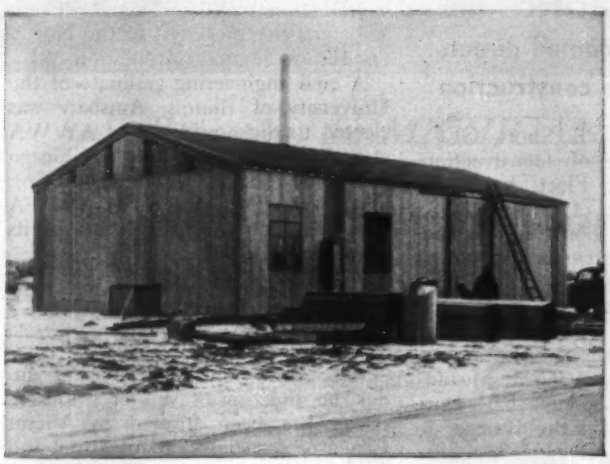
VERSATILE. Armco Buildings are designed as permanent structures, but are also easily dismantled and re-erected on new sites. This is one of ten used as field offices. They have been erected, dismantled, moved and re-erected many times without loss of material.

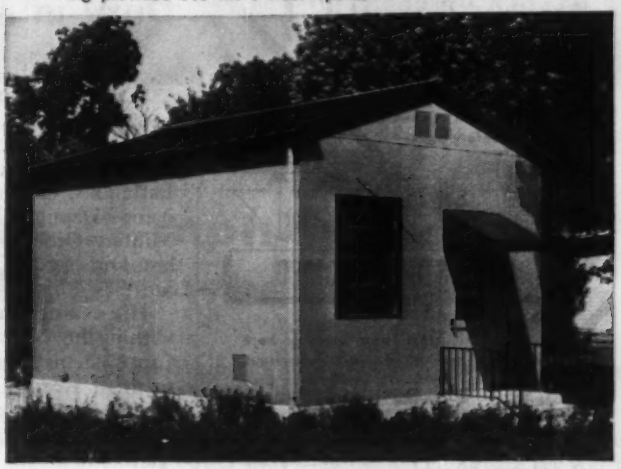


DURABLE. This Armco Steel Building was first erected on another site in 1935. Two years later it was completely dismantled and re-erected at its present location. After twenty years, this durable, all-steel structure still looks neat and attractive.

FAST ERECTION. After foundation was laid for this warehouse, it took less than 8 hours to erect walls and roof and install doors and windows. The completed Armco Building was 28′ wide, 50′ long, 12′ high. It went up at the rate of 3 square feet per minute!

ECONOMY. Specifications for a dial telephone exchange building required dryness, wind- and dust-tightness. This Armco Building met these needs and saved 26.3% of the cost of a masonry type of structure. Also, the Armco Building provided 9% more floor space.





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Armco Steel Buildings are economical, quickly erected, durable, and easily dismantled and re-erected. And the above photos and captions give you case-history evidence to prove it!

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Special cross bar effects smoothest, most efficient one-piece welded construction, assuring maximum strength with minimum weight, and safety underfoot.

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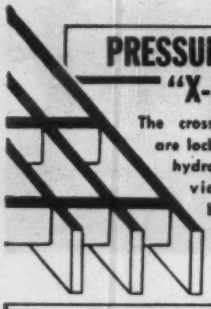

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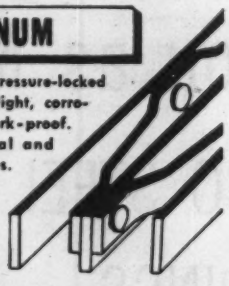

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MEN AND JOBS

Rear Admiral W. B. Short

Duty in Madrid

Adm. Short named director Spanish base construction

Rear Admiral W. B. Short, CEC, USN, Commander of Construction Battalions, Atlantic Fleet, has been named Deputy Chief of the Joint U. S. Military Group for Construction, and also Director of Construction, for military bases in Spain.

His reassignment, one of a series within the Navy's Civil Engineering Corps, stems from the recent appointment of Rear Admiral R. H. Meade, former director of Spanish base construction, as Chief of the Bureau of Yards and Docks (ENR Nov. 3, p. 28). Captain A. J. Fay, District Public Works Officer for the Fifth Naval District, will succeed Admiral Short at the Naval Construction Battalion Center in Davisville, R. I.

Admiral Short, who served after the war as Assistant Chief for Administrative Management in the Bureau of Yards and Docks, has been Commander of Construction Battalions, Atlantic Fleet, since Sept. 1953. A native of Mississippi and a Naval Academy graduate with a master's degree in civil engineering from Rensselaer Polytechnic Institute, he's been associated with naval construction for more than 25 years.

Both Admiral Short and his successor, Captain Fay, served with the Seabees in the Pacific during World War II and received the Legion of Merit with Combat "V" for exceptionally meritorious service in the Okinawa campaign.

With Captain Fay's departure from Norfolk, Va., Rear Admiral William Shiler, now District Civil Engineer for the Fifth Naval District, will assume additional duty as District Public Works Officer.

AWWA's President Amsbary Joins a Long Island Utility

Frank C. Amsbary, Jr., president of the American Water Works Association, last week became vice president and general manager of the Long Island Water Corporation, which serves 26 communities in a section of New York's Nassau County.

Active in the field of water supply engineering and management for more than 30 years, Amsbary came to the Lynbrook, Long Island, utility from Champaign, Ill., where he served as vice president and secretary of the Illinois Water Service Company and vice president of the Northern Illinois Water Corporation.

A civil engineering graduate of the University of Illinois, Amsbary was elected to the presidency of AWWA at its 75th annual meeting in Chicago last June (ENR, June 9, p. 56), having previously served as AWWA vice president and as director of its Illinois section.

Victor Gruen & Associates Establish a New Division

A telecommunications division, under the direction of Walter J. Duschinsky, has been formed by Victor Gruen & Associates, architectural and engineering firm with offices in Los Angeles, Minneapolis, Detroit and New York.

According to Victor Gruen, the new division is designed to provide specialized, integrated services in the fields of communications, electronics and automation, and to originate and execute new projects in the telecommunications field. Included within the area of its operations are television and radio broadcasting, common carrier structures, electronic systems and automation planning for business and industry, medical electronics, and military communications, including radar and guided missiles.

Duschinsky, whose headquarters will be in Los Angeles, planned and designed the basic communications concepts in the United Nations building in New York, and planned and supervised construction of Asia's first TV station, located in Tokyo.

Report on the MICHIGAN TURBO-DOZER:

New dozer features 27 mph speed, power-tilting bowl, rear-wheel steer

The new 2¾ yd. capacity Michigan Turbo-Dozer combines rubber-tired speed and mobility with outstanding traction and power. Its turbocharged diesel engine develops 165 hp, with maximum rimpull of 28,000 lbs.—plenty of power for heavy dozing, push-loading and land clearing. At 27 mph, it runs rings around any dozer on the market!

Power-tilting bowl. A powerful double-acting hydraulic cylinder tilts the bowl back and forth through a 33 degree arc. You can change the angle of the bowl from "dig" to "float" as you travel—work the cutting edge back and forth under stumps and boulders to uproot them. Two 6-inch lift cylinders give you tremendous lifting power and down-pressure—you can raise the cutting edge from 24¼ inches below ground level to 43¾ inches above.

High flotation tires, oscillating axle. Big 18.00-25 low pressure tires (nearly 7-foot tread) give the Turbo-Dozer excellent ground contact in dry, wet or sandy footing. You can cross railroad tracks or travel along the ties or road bed; you can climb curbs and drive safely on any kind of road surface. On uneven terrain, the steering-drive axle oscillates to keep both rear wheels in firm contact with the ground. With 14½ inches of ground clearance underneath, it's practically impossible to get "hung up"

Full traction while turning. The Turbo-Dozer gives you full tractive effort even in a turn. *All four wheels are always driving,* except when you declutch the rear axle for highway travel. Rear-wheel steering eliminates unnecessary tire wear —you don't brake or drag your inside wheels on a turn. If one wheel begins to slip, a locking differential automatically applies power to the wheel with the firmest footing.

Power-shifting, 300% torque multiplication. Clark's exclusive power-shift transmission eliminates the conventional engine clutch and foot pedal—the most notorious cause of excessive maintenance and operator fatigue. With two finger-tip levers on the steering column, the operator can instantly shift between High-Low and Forward-Reverse—even when moving in either direction.

The 3-to-1 Clark torque converter gives you a steady power flow, regardless of speed. As the load gets heavier the torque output automatically increases up to 300% at stall speed—gives you the extra torque to plow through the toughest spots. You can't stall the engine, and there's no clutch to slip.

Prove it for yourself. The new Michigan Turbo-Dozer gives you faster cycles and more yardage in every shift—more dollars of profit every day. Ask your local Michigan distributor to prove it, with an on-the-job demonstration; or write direct for detailed specifications. The Turbo-Dozer is available on the low-cost Michigan Lease Plan: no down payment, pay as it produces!

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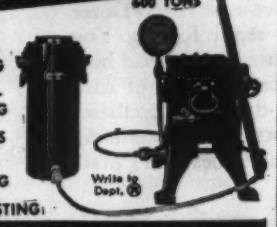

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RESEARCH

University Gives Industry Voice in Academic Affairs

Robert A. W. Carleton, construction engineer and former president of the Hudson and Manhattan Railway, has been elected chairman of the newly-formed Engineering Council of New York's Columbia University.

Authorized by the trustees of the university, the council has been established to advise and assist the trustees, faculty and dean of engineering in the development of the School of Engineering and the Engineering Center.

According to the new chairman, the council, which will develop its own program of activities and establish subcommittees, "will actively engage in helping to guide the policies and expansion program of the School of Engineering."

"In this present era of manpower shortages and continuing expansion of our technology," Carleton said, "it is up to industry, the principal user of trained engineers, to interest itself actively in the production of one of its most important basic resources, manpower. As representatives of a number of industries, we of the council plan to do just that."

Canadian and Swiss Firms Have Own Mutual Aid Plan

An agreement for cooperation on an international scale in the professional engineering field has been reached by Sandwell & Co., Ltd., Vancouver, B. C., consulting engineers, and Electro-Watt Electrical and Industrial Management Co., Ltd., Zurich, Switzerland.

P. R. Sandwell, head of the Vancouver engineering firm, has announced that the Swiss firm will place at the disposal of the Canadian company its extensive engineering experience in the electrical power field, while Sandwell will contribute its experience in forestry products.

Electro-Watt has completed many of the large power projects undertaken in Europe since the end of World War II, and Sandwell presently is working as consulting engineer on pulp and paper projects throughout the world.

Men and Jobs Briefs . . .

• **Associations**—The Structural Engineers Association of California elects **C. M. Herd** of the California Division of Architecture as president . . . **W. Howard Parsons** is appointed executive director of the Pennsylvania Association of Home Builders.

• **Corps of Engineers – Nicholas P. Oglesby** is appointed chief of the Construction Equipment Section at the Research and Development Laboratories, Fort Belvoir, Va. He succeeds **Richard C. Navarin,** now head of the Mechanical Equipment Branch.

• **Business–Paul Carlino** and **Janusz Piotrowski,** bridge engineers formerly with Tippets, Abbett, McCarthy, Stratton, join Barstow & Mulligan, New York consulting engineers, as associates . . . **Clark & Groff Engineers** and **Benjamin E. Cave,** architect, form a new firm known as Clark, Groff & Cave, engineers and architects, Salem, Ore.

R. Conrad Cooper, who started his career as a field engineer for Universal Portland Cement Co., is elected vice president, administration - planning, U. S. Steel Corp. . . . **Walter Lovett,** a former assistant professor of civil engineering at the University of Pittsburgh, is appointed manager of Pittsburgh Corning Corporation's new Technical Service Department . . . **Carl J. Snyder** is transferred to the general offices of Owens-Illinois Glass Co. in Toledo, where he'll be responsible for coordinating and administering major construction and engineering service contracts.

The E. J. Longyear Co., Minneapolis, names **A. F. Pickard** assistant manager and **J. C. C. Blair, Jr.** general field superintendent for its contract drilling division . . . **Arthur G. Taffel, Jr.,** a University of Oklahoma civil engineering graduate, opens an architectural office in Louisville, Ky. . . . **Daniel P. Morse** is named vice president and general manager of Indianapolis Water Co.

Daniel, Mann, Johnson & Mendenhall, Los Angeles architects and engineers, name nine members of the firm as associates. The nine individuals, who become the firm's first associates, are assuming line and staff responsibility for over $250 million worth of projects . . . In Ashville, N. C., **Baxter H. Taylor, S. H. Bushnell** and **E. S.** Pinson form a construction firm known as the Blue Ridge Structure Co.

• **Retirements–E. A. Wood,** first city plan engineer for Dallas, Texas, after 23 years of city service. Appointed city plan engineer in 1922 and reappointed in 1939 after several years in private practice, the Cornell University civil engineer became zoning supervisor for enforcement in 1950 . . . **Don B. Shipman** from the planning and design branch of the Corps of Engineers in Louisville, Ky., after 22 years of engineering service.

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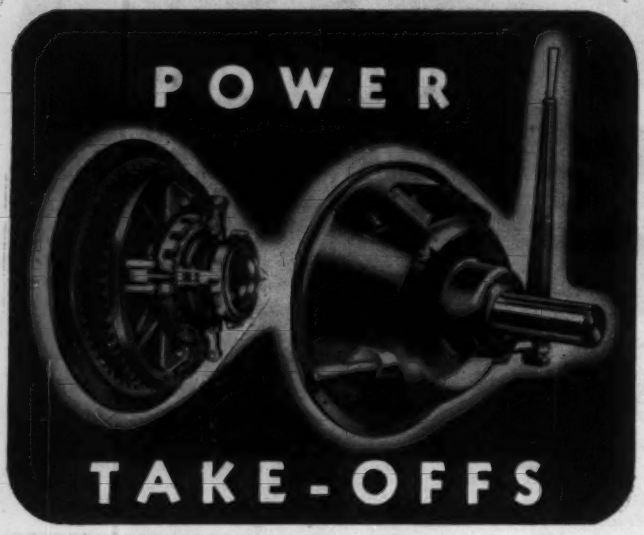

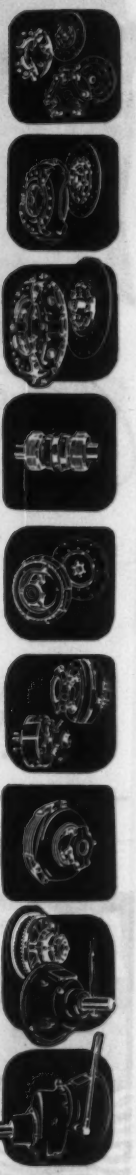

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OBITUARIES

Ray Messinger Murray, 79, a consulting engineer of Seattle, died there Oct. 20. For the last three years, he had been engaged in planning of a bridge and highway improvement program from the city of Ketchikan, Alaska. He had lived in the city of Seattle since 1929, working with the state highway department and the Seattle engineering department. Murray was a graduate of Ohio Northern University and later headed its engineering department. He was employed by the United States Steel Corp. in Pittsburgh for a number of years, later worked in the engineering departments of various railroads in the Midwest and Pacific Northwest.

Blair Burnson, 43, executive assistant to the general manager of the East Bay Municipal Utility District, Oakland, Calif., died Oct. 26. Burnson was a graduate of the University of California and joined the utility district as a civil engineer in 1935. He had served in his last assignment since May, 1954, and prior to that was supervising sanitary engineer for EBMUD for five years.

O. L. Canfield, 72, vice-president and director of Albert Kahn Associated Architects & Engineers, Inc., Detroit, died Sept. 20 in Royal Oak, Mich. In addition to heading Kahn's cost-estimating division of the firm, he also represented the firm as coordinator on Army and Navy projects and on construction of war plants. In recent years he played a leading role in the erection of industrial plants. His association with the Kahn firm began in 1915. In 1940 he was made an associate and in 1945 was elevated to the post of vice-president and director of the company.

Jacob S. Langthorn, 88, former consulting engineer to the president of the Borough of Manhattan, died Oct. 23 at Mt. Dora, Fla. He entered city service as a development engineer with the New York Board of Water Supply. Next he was assigned to Brooklyn as deputy commissioner of the Department of Water Supply. One of his projects was planning underground magazines for dynamite used on the Catskill water tunnels. For some years he was president of Langthorn & Smith, engineering contractors. During World War I he was engaged in construction work for the Cyanamid Co. at Muscle Shoals. He received his civil engineering degree from Columbia University.

How Beth-Cu-Loy drainage pipe made this job easier

On this job the pull shovel that dug the trench doubled in brass as a hoist, in laying a section of 36-in. storm sewer. No need for a feather bed here, for this pipe was fabricated from galvanized Beth-Cu-Loy steel: tough enough to make mollycoddling needless, flexible enough to conform to irregular grade conditions.

A Beth-Cu-Loy drainage installation can be counted on to last the lifetime of the project. It can flex longitudinally or transversely to absorb changing loads caused by shifting soils or freezing action. Thus it can withstand greater impact and vibrational stresses than rigid materials.

Beth-Cu-Loy steel is extra-resistant to corrosion because it contains 0.20 to 0.30 pct copper. The galvanized coating is of Prime Western zinc and will satisfy the 2-oz triple spot test required. Culvert pipe made of Beth-Cu-Loy fully complies with the American Association of State Highway Officials and Federal Specifications adopted by most states.

Bethlehem manufactures the Beth-Cu-Loy galvanized corrugated and flat steel stock used by pipe producers. If you would like to have further information about Beth-Cu-Loy, or the names of those who fabricate it into pipe, just get in touch with the nearest Bethlehem office.

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CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded—First Section—

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J. A. MAHONEY, M. WETZEL, L. M. WINISKI, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—BA

† **Mass., North Attleboro**—BA 11/21—Regional Director, Fish & Wildlife Service, 59 Temple Place, Boston, Zone 11, rein. water control structure at U. S. Fish Cultural Station, Bid FWS-2130.

BUILDINGS—BA

▲ **Mass., Northfield**—SCHOOL—BA 12/1—Pioneer Valley Regional School Dist., c/o F. Sumner Turner, supt. schools, Center School, Northfield, regional high school, $1,000,000, The Architects Collaborative, 96 Mt. Auburn St., Cambridge, archts.

▲ **Mass., Springfield**—SCHOOL—BA 12/1—City, City Property, City Hall, John J. Duggan Junior High School, Bradley and Wilbraham Sts. $2,500,000. Plans deposit $100. Morris W. Maloney, 220 Dwight St., archt. CD 12/29/53.

HEAVY CONSTRUCTION—LB & CA

▲ **J. R. Cianchette**, 120 S. Main St., Pittsfield, Me. CA $6,380,755, est. $6,000,000. airfield pavements, runway and taxiway lighting FY 56 Dow Air Force Base, ENG-19-016-56-24, BANGOR, ME. U. S. Eng., 857 Commonwealth Ave., Boston, Mass. CD 11/2, under LB.

▲† **Raymond Delong**, 140 Cedar St., New York, N. Y. LB $7,436,000. (joint venture) Item No. 3 LB $8,017,000. (joint venture) TT3 Item No. 2 constr. emplacement Texas Towers, in Atlantic Ocean off New England Coast, NOY 88202, Spec. 47141/TTI, MASSACHUSETTS. First Naval Dist., 495 Summer St., Boston, Mass. Bids Nov. 1, CD 9/16;
J. Rich Steers, Inc., 17 Battery Place, New York, N. Y. and **Morrison-Knudsen Co., Inc.**, 122 E. 42 St., New York, N. Y. LB $8,739,000. (joint venture) TT4 No. 4. (Massachusetts).

Poirier & McLane Corp., 33 W. 42 St., New York, N. Y., CA, $400,000. Hammonasett Dam, North Madison, 18 mi. east of NEW HAVEN, CONN. New Haven Water Co., 100 Crown St., New Haven, Conn. Bids Oct. 17. CD 10/10.

BUILDINGS—LB & CA

D. A. Sullivan & Sons, Inc., 82-84 North St., Northampton, Mass. CA Approx. $550,000. DORMITORY No. 14 (addn. to present Dormitory No. 13), AMHERST, MASS. University of Mass., Alumni Assoc., Alden C. Brett, pres., Amherst, Mass. Hubbard, Tracey & Blakely, 177 State St., Boston, Mass., engrs. Bids Oct. 27. CD 10/18.

Vappi & Co., Inc., 240 Sidney St., Cambridge, Mass. CA Approx. $800,000. Sales Unit PLANT addn., Squires Plant, Gore St., SOMERVILLE, MASS. Swift & Co., 165 Gore St., Somerville, Mass. Bids Sept. 30. CD 8/30.

Frechette & Flaryan, Inc., 64 Edwards St., Hartford, Conn., CA, $698,900, Braeburn Rd. Elementary SCHOOL, WEST HARTFORD, CONN. Town School Bldg. Comn., Town Hall, West Hartford, Conn. Bids Oct. 14. CD 10/21, under LB.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

D. C., Wash.—BA 11/22—D. C. Govt., Dpt. Hys., 499 Pa. Ave. N.W., widening Key Bridge, consisting removing existing tracks, asph surf., sidewalk, railing and concrete roadway and cantilever sidewalk and lighting sys. Plans deposit $20. CD 11/21/51.

New York—BA 11/30—Power Authority of the State of New York, 270 Broadway, New York, Zone 7, St. Lawrence Power Proj., furnishing, delivery of intake, service and emergency gates for Barnhart Island Power Plant and Massena Intake, Spec. No. Pa-5-15054, St. Lawrence Contr. No. P24. Plans deposit $20. Uhl, Hall & Rich, 230 Congress St., Boston 10, Mass., engrs. CD 8/18/54.

New York—BA 12/6—Power Authority of State of New York, 270 Broadway, New York, Zone 7, St. Lawrence Power Proj., furnishing, delivery of unit control boards, Spec. No. PA-5-14017, St. Lawrence Contr. No. P-30. Plans deposit $10. Uhl, Hall & Rich, 230 Congress St., Boston 10, Mass. CD 8/18/54.

BUILDINGS—BA

▲ **N. Y., Brooklyn** — SCHOOL — BA 11/30 — Bureau Constr., Bd. Educ., 42-15 Crescent St., Long Island City, Zone 1, general constr. Junior High School 1278, Stuart St. and Fillmore Ave. $2,260,000. Plans deposit $35. CD 8/2.

▲ **N. Y., Kew Gardens**—COURT BLDG. and PRISON—BA 11/30—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, general constr., plumbing work, heating and ventilating work, electrical work for demolition, foundation and structural steel work for new Criminal Court Bldg. and Prison, Queens Blvd., Hoover Ave., 132 St. and 82 Ave., Queens Boro. Total est. $12,000,000. Plans deposit $50. CD 3/10/54.

▲ **N. Y., Long Island City**—SCHOOL—BA 12/1—Bd. Educ., Bureau Constr., 42-15 Crescent St., Long Island City, Zone 1, general constr. Junior High School 204, 37 Ave., 28 and 29 Sts. $2,130,000. Plans deposit $30. CD 1/21.

▲ **N. Y., New York** — SCHOOL — BA 12/6 — Bureau Constr., Bd. Educ., 42-15 Crescent St., Long Island City, Zone 1, general constr. New York School of Printing, W. 49 and W. 50 Sts. between Ninth and Tenth Aves., Manhattan Boro. $3,751,000. Plans deposit $35. CD 4/5, under LB.

▲ **Pa., Johnstown** — REHABILITATION CENTER — BA 12/14—General State Auth., 18 and Herr Sts., Harrisburg, rehabilitation center. $6,000,000. Plans deposit $50. Buchert Eng. Corp., 611 W. Market St., York, engrs.-archts. CD 11/30/54.

▲ **N. Y., Flushing**—PHYSICAL EDUCATION—BA 12/15—Bd. Higher Educ., Queens College, Business Office, 65-30 Kissena Blvd., Flushing, Zone 67, health and physical education bldg. of Queens College. $2,500.000. Plans deposit $60 general constr., $40 plumbing work, $30 heating and ventilating work, $40 electrical work. Extended date. CD 10/24.

HEAVY CONSTRUCTION—LB & CA

Midboro Constr. Corp. & Lynboro Constr. Co., 1163 61 St., Brooklyn 19, N. Y. LB **$429,249** (9 bidders) storm sewer in prolongation of Ave. K, E. 98 St., E. 100 St., E. 104 St., Rockaway Parkway; sanitary sewer in Ave. K, E. 98 St., E. 104 St., Rockaway Parkway, Ave. K., and grading, BROOKLYN, N. Y. President Brooklyn Boro, Boro Hall, Brooklyn 1, N. Y. Bids Nov. 3. CD 10/28.

▲† **E. J. Albrecht Co.**, 2626 W. 26 St., Chicago, Ill. LB $2,077,869. (5 bidders) local flood protection proj., channel Imprv., Wills Creek, Section 2 and 3 and Viaduct Pumping Station, CIVENG-49-080-56-5, MARYLAND and WEST VIRGINIA. U. S. Eng., First and Douglas Sts. N. W., Wash. 25, D. C. Bids Nov. 3. CD 10/27.

James Parreoc & Son, 1915 Shepherd St. N.E., Wash., D. C. LB $247,235. storm drain, from Northeast Branch to B. & O. R.R., Riverdale, Contr. 26-D, HYATTSVILLE, MD. Washington Suburban Sanitary Comn., Hamilton St., Hyattsville, Md. Bids Oct. 31. CD 10/19.

† **Officer of Architect of Capitol**, U. S. Capitol, Wash., D. C., rejected bids Sept. 27, reconstr., repair, alterations, imprv. areas located above and vicinity of legislative garage, U. S. Capitol Grounds, WASH., D. C., LB $567,700. Will re-advertise. CD 10/3, under LB.

BUILDINGS—LB & CA

▲ **Applegate Ridge Homes**, c/o Bonded Realty Corp, Sunrise Hy., Lindenhurst, N. Y. Owner Builds. $1,650,000. 150 HOUSES on tract on Sunrise Hy., east of Brentwood Rd., BRENTWOOD, N. Y.

▲ **Wigton-Abbott Corp.**, 1225 South Ave., Plainfield, N. J. CA, $2,000,000. design and construct RESEARCH LABORATORY, 100-acre tract, CRANBURY, N. J. Cites Service Oil Co., 70 Pine St., New York, N. Y.

E. Eyring & Sons Co., 808 S. Conklin St., Baltimore 24, Md. LB $372,797, est. $300,000. concrete, steel, stone, masonry SCHOOL addn., BALTIMORE, MD. Shrine of the Little Flower, 2800 Brendan Ave., Baltimore, Md. John F. Eyring, 2505 Fait Ave., Baltimore 24, Md., archt.

Philip Macht, 11 E. Fayette St., Baltimore 2, Md. Owner Builds. $512,000. 59 brick, 20x32x27 ft., DWELLINGS, 4700 Blvd., Elison Drive, 4700 Parkville Dr., 1600 Hartsdale Rd. and 1600 block Ingram Rd., BALTIMORE, MD. Lawrence A. Menefee, 347 N. Charles St., Baltimore 1, Md., archt. Albert E. Pohmer, 833 Park Ave., Baltimore 1, Md., engr.

▲ **Philip Vizzini & Son, Inc.**, 818 N. Franklintown Rd., Baltimore 16, Md. CA $1,159,000. masonry Gwynns Falls Parkway Elementary SCHOOL, BALTIMORE, MD. City, Bureau Bldg. Constr., 410 Municipal Bldg., Baltimore 2, Md. CD 10/31, under LB.

Steiner Constr. Co., 2122 Maryland Ave., Baltimore 18, Md. CA $416,200. 2 story, brick, concrete, steel front and rear HOSPITAL addns., BALTIMORE, MD. Union Memorial Hospital, 33 and Calvert Sts., Baltimore 18, Md. Jas. R. Edmunds Jr., 1027 St. Paul St., Baltimore 18, Md., archt. Bids Oct. 27. CD 10/10.

Hill, Schrider & Kimmel, Inc., 8248 Georgia Ave., Silver Spring, Md. LB $382,270. 60x220 ft., stone, steel, brick CHURCH, SILVER SPRING, MD. First Baptist Church, Wayne Ave., Silver Spring, Md. Ronald S. Senseman, 7705 Georgia Ave. N.W., Wash., D. C., archt.

SOUTH

HEAVY CONSTRUCTION—BA

Va., Richmond—BA 11/29—At office, J. W. Huffman, city purch. agt., Mosque Bldg., Laurel and Main Sts., Division H, furnish labor, materials, equip. and work for constr. Gambles Mill Road Pumping Station, south of and adjacent to River Rd. at Gambles Mill Rd., near westerly corp. line of City of Richmond. Plans deposit $25. Greeley & Hansen, 220 S. State St., Chicago 4, Ill., engrs. CD 3/31/54.

† **Florida**—BA About 12/15—U.S. Eng., P. O. Box 4970 Jacksonville, widening, deepening Tampa Bay Channel Tampa Harbor, Tampa, incl. 5,400,000 cu. yd. excav., CIVENG-08-123-56-24. CD 9/19.

BUILDINGS—BA

▲ **S. C., Camden**—HOSPITAL—BA 11/16—Kershaw Co. Hospital Bd., Camden, 118-bed hospital. $2,500,000. Plans deposit $100. Lockwood Greene Engineers, Inc., Montgomery Bldg., Spartanburg, engr. CD 2/17/53.

S. C., Columbia—SCHOOL—BA 11/22—School Bd., Richland Dist. No. 1, Columbia, 36,500 sq. ft. Satchel Ford School. G. Thomas Harmon, 3550 Millwood Ave., archt.

† **S. C., Beaufort**—OFFICERS QUARTERS—BA 11/29—Dist. P. Wks. Officer, Sixth Naval Dist., Bldg. No. 12, U. S. Naval Base, Charleston, bachelor officers' quarters, U. S. Marine Corps Auxiliary Landing Field, NOY 91175. Spec. 49110. Plans deposit $60. CD 6/30.

† **S. C., Greenwood**—TRAINING CENTER—BA About 12/14—U. S. Eng., 31 Customhouse, Charleston, Army Reserve Training Center, ENG-38-081-56-36.

HEAVY CONSTRUCTION—LB & CA

† **American Dredging Co.**, 12 S. 12th St., Phila. 7, Pa. CA $771,153, dredging West Waterfront, U. S. Naval Base, IFB NOY 91305, NORFOLK, VA. P. Wks. Office Fifth Naval Dist., U. S. Naval Base, Norfolk 11, Va. Bids Sept. 13. CD 8/30.

(Continued on page 74)

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England
Middle Atlantic
South
Middle West
West of Mississippi
Far West

PROPOSED WORK
Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Public Buildings
Mass Housing
Commercial Buildings
Industrial Buildings
Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.

LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily issue in which last previous report was published.

OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
ENR Engineering News-Record
CD Construction Daily

For additional reports see Construction Daily.

NASHVILLE, TENN.

Nashville Filter Plant

(EXPANSION COMPLETED IN 1951)

THE CHESTER ENGINEERS
Consultants
PITTSBURGH, PENN.

Nashville Filter Plant showing aerator, grit chamber, mixing basins, setting basins, and filter building.

Mr. Robert L. Lawrence, Jr., Director and Chief Engr. Water Works Dept., at the Master Control Table in the original plant lobby.

Filter Operating Gallery.

This 56 MGD Plant is a good example of what can be accomplished through: (1) careful engineering, (2) improved chemical treatment techniques, and (3) efficient operation by means of complete instrumentation and control. These factors have resulted in substantial savings in the cost of treated water at Nashville.

Builders Water Works Equipment (installed in the new section by J. B. Michael & Co., Inc.) has contributed to this successful history, both in the original plant and in the recently completed addition. For a detailed description of this equipment — Filter Controllers and Gauges, Pneumatic Master Control System, Chronoflo Meters and Summator, and Wheeler Filter Bottoms — address Builders-Providence, Inc., Providence 1, Rhode Island.

BUILDERS-PROVIDENCE

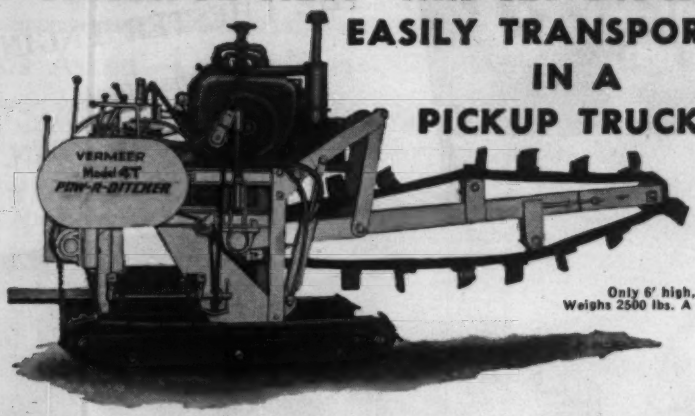
DIVISION OF B-I-F INDUSTRIES, INC.

BUILDERS IRON FOUNDRY • PROPORTIONEERS, INC. • OMEGA MACHINE CO.

BIF METERS FEEDERS CONTROLS

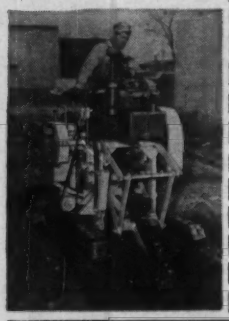
POWERFUL NEW "MIDGET DITCHER"

EASILY TRANSPORTED IN A PICKUP TRUCK



Only 6' high, 13' long.
Weighs 2500 lbs. A real workhorse.

ONLY 42" WIDE



VERMEER MODEL 4T POW-R-DITCHER
Digs 6" to 14" Wide and 4½' Deep

Here's the "midget ditcher" they are talking about! The 4T POW-R-DITCHER is designed specifically for laying gas pipe, water and cable lines and digging foundation footings. Its narrow width makes the 4T ideal for those "tight spots." Digs at speeds of 1' to 17' per minute, depending on depth and soil conditions. Powered by a 15 or 25 h.p. Wisconsin engine. The 4T POW-R-DITCHER is built for service and answers the need for a small, rugged inexpensive ditcher. A self propelled and one-man operated machine. Has same size moving parts as larger POW-R-DITCHER models. Write for name of distributor and complete information. Larger POW-R-DITCHER models also available.

VERMEER MANUFACTURING CO., PELLA, IOWA

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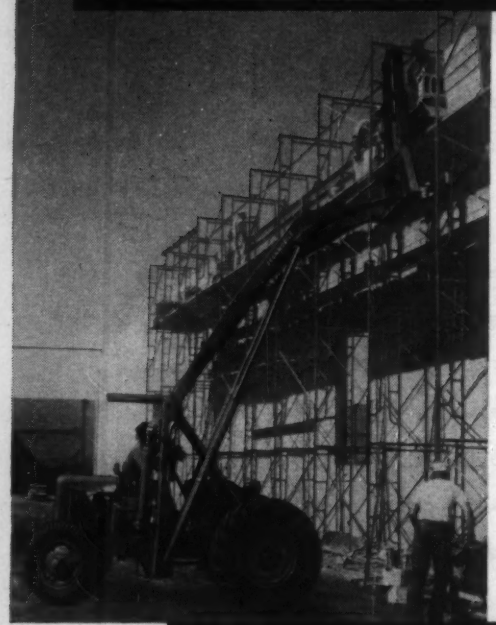
reach?... the ECONMOBILE 600 LOADER has it!



The ECONMOBILE has a reach of up to 6 feet from wheel to heel of the pallet fork or auxiliary tower. That means you can easily move your material up and over the scaffolding as well as obstructions.

The ECONMOBILE has these other outstanding features: Hoisting height up to 22'; built-in ruggedness; power; stability; versatility; mobility; maneuverability; traction and flotation.

The savings in general labor effected through the use of the ECONMOBILE exceeds 70%.

write, wire or call

AMERICAN ROAD EQUIPMENT COMPANY
4306 North 28th Street Omaha, Nebraska
Phone PLeasant 2575

(Continued from page 72)

† J. R. Houska Co., 1100 Billings St., Norfolk, Va. LB $684,374. modication to turbo-prop engine overhaul shop, Naval Air Station, NOY 83200, Spec. 41385, NORFOLK, VA. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk 11, Va. Bids Nov. 1. CD 9/28.

† S. Morgan Smith Co., York, Pa., and CDC Control Services, Hatboro, Pa., CA $200,010, pressure control sys. for Flow Converter D, gas dynamics facility, Arnold Engineering Development Center, ENG-40-126-56-10, TULLAHOMA, TENN. U. S. Eng., P. O. Box 2091, Tullahoma, Tenn. CD 11/16/54.

BUILDINGS—LB & CA

▲ Prather & Carter, Harlem, Ga., LB, $1,335,400. Harlem Elementary and High SCHOOL addns., Appling Colored Elementary and High SCHOOL, Evans Elementary and High SCHOOL, Harlem Colored Elementary SCHOOL, Grovetown Elementary SCHOOL addn. and mech. remodeling, Phinizy Elementary SCHOOL, Appling Elementary SCHOOL and Evans Elementary SCHOOL, APPLING, GA. State School Bldg. Auth., Kemper Bldg. 41 Exchange Pl. S.E., Atlanta, Ga. Bids Nov. 1. CD 9/19.

Central Constr. Co., 44 Franklin St., Atlanta, Ga., CA, $529,382, HIGH SCHOOL, Sandy Springs, ATLANTA, GA. Fulton Co. Bd. Educ., Court House, Atlanta, Ga. Bids Nov. 1, awarded Nov. 2. CD 6/20.

S. J. Curry & Co., Albany, Ga., LB, $948,700. Lawson Elementary and Terrell High SCHOOL addn., Brownwood Elementary SCHOOL mech. remodeling; Graves Elementary SCHOOL mech. remodeling; Parrott Elementary SCHOOL mech. remodeling, Sasser Elementary SCHOOL mech. remodeling, County Colored high SCHOOL, Northside Elementary SCHOOL, Dunbar Elementary SCHOOL, Helen Gurr Elementary SCHOOL, Martin Elementary SCHOOL in Terrell Co., DAWSON, GA. State School Bldg. Auth., 41 Exchange Pl. S.E., Atlanta, Ga. Bids Nov. 1. CD 10/7.

▲ Virginia Engineering Co., 80-29 St., Newport News, Va. CA Approx. $2,000,000 (12 bidders) superstructure WAREHOUSE, north section, Appliance Park, Benchel, LOUISVILLE, KY. General Electric Co., River Rd., Schenectady, N. Y. Bids Oct. 14, awarded Nov. 1.

▲ Virginia Engineering Co., Inc., 80 29 St., Newport News, Va. CA Approx. $3,000,000. (11 bidders) addns. to Home LAUNDRY Bldg. No. 1, Appliance Park, Benchel, LOUISVILLE, KY. General Electric Co., River Rd., Schenectady, N. Y. Bids Oct. 14, awarded Nov. 1. CD 10/7.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

Mich., Albion—BA 12/14—City, John P. Bentlu, clk., City Hall, sewage disposal plant, treatment facilities, $500,000. Plans deposit $10, refundable, Jones, Henry & Williams, 821 Security Bldg., Toledo, O., engrs. CD 4/20.

BUILDINGS—BA

O., Berea—DORMITORY—BA 12/6—Baldwin-Wallace College, Berea, women's dormitory. $700,000. Plans deposit $50. Mellenbrook, Foley & Scott, 20 Beech St., archts. CD 5/4/50.

HEAVY CONSTRUCTION—LB & CA

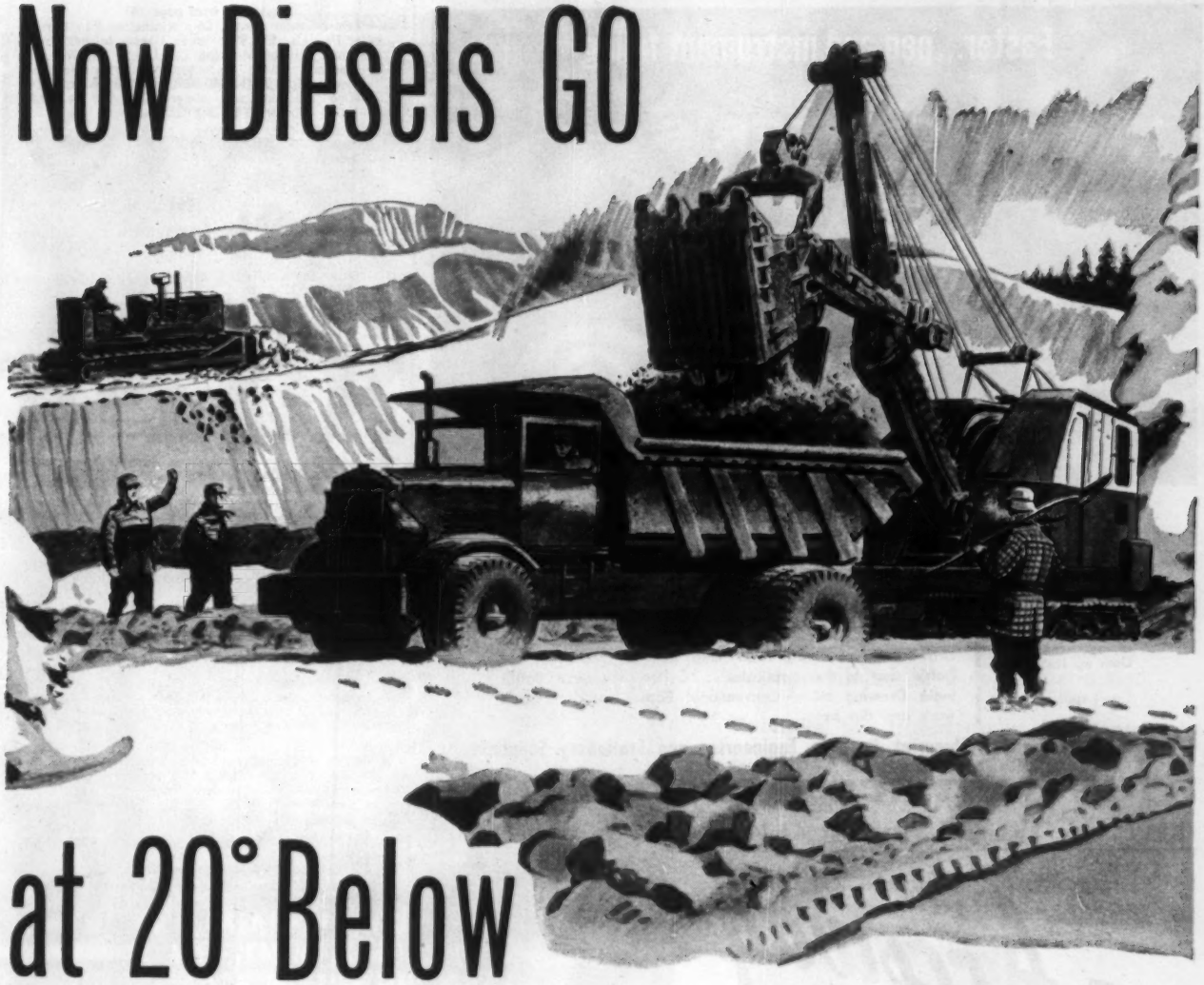
▲ OHIO—State Hy. Dpt., Columbus,
O.—Codell Constr. Co., 125 S. Main St., Winchester, Ky. CA $2,405,863, est. $2,647,500. Type T-71 and structures 8.024 mi. U.S.R. 50, Sections (4.01-11.91) Lee, Alexander and Athens Twps. and Village of Albany, Athens Co.;
O.—V. N. Holderman & Sons, Inc., 890 Oakland Park Ave., Columbus, O. CA $1,528,931, est. $1,764,000. Type T-71 and structures 5.371 mi. U.S.R. 23, Sects. 0.00 19.14, Green Twp. and in Pickaway Twp., Pickaway and Ross Counties;
O.—The Horvitz Co., 4375 E. 146 St., Cleveland, O. CA $526,496. Type T-71 4.021 mi. S.R. 2, Sects. (0.00-3.97), city of Eastlake, village of Willowick, city of Wickliffe and city of Willoughby, Lake Co. Grand total $4,461,290. CD 11/3, under LB.

▲† The Savin Constr. Corp., Div. Merritt-Chapman & Scott Corp.'s Constr. Dpt., 10 Village St., East Hartford, Conn. CA $16,312,765. 1,200 ft. long, Ohio River locks, 110 ft. wide, as part of New Cumberland Locks and Dam Proj., OHIO and WEST VIRGINIA. U. S. Eng., 925 Federal Bldg., Pittsburgh 19, Pa. CD 10/25, under LB.

▲ ILLINOIS—Dpt. P. Wks. & Bldgs. Div. Hys., Centennial Bldg., Springfield,
Ill.—Superior Concrete Constr. Co., 5913 Woodlawn Ave., Chicago 15, Ill., LB, $173,815 railroad grade separation, U.S. 66 over E. J. & E. R. R., Will Co.; LB $159,966, dual grade separation carrying U.S. 66 over U.S. 30, Will Co.;
Ill.—E. H. Swenson & Son, 14 Henderson Ave., Joliet, Ill., LB, $130,553, grade separation carrying interchange ramp over U.S. 66, Will Co.; LB $169,326, 1 grade separation carrying U.S. 55 over U.S. 66, Will Co.;
Ill.—N. S. Gorman Constr. Co., 4408 State St., East St. Louis, Ill., LB, $171,241 1 grade separation carrying U.S. 40 By-pass over U.S. 66, Madison Co.;
Ill.—McCann & Co., Inc., 812 Reisch Bldg., Springfield, Ill., LB, $151,829. grade separation structures carrying S.A. 6 over U.S. 66, Madison Co.;
Ill.—Russell Manning, Oquawka, Ill., LB $123,287 2 three-span I-beam bridges, F.A.S. 415, Henderson Co.;
Ill.—A. Olson Constr. Co., 1225 Commercial St., Waterloo, Iowa, LB, $274,609. grade separation structure, 1 concrete slab bridge, U.S. 51, Rockford and Winnebago Counties;

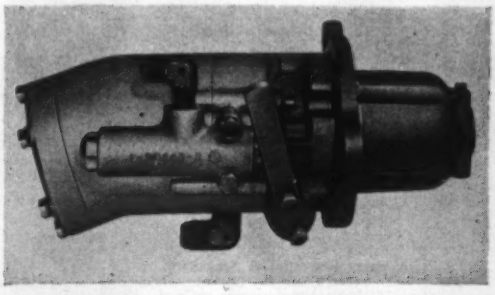
(Continued on page 76)

Now Diesels GO



at 20° Below

New Hydrostarter Spins Engines Faster



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Now, before winter sets in with a vengeance, is the time to put a new, low-cost Aeroproducts Hydrostarter on your Diesel.

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It replaces conventional starting systems, frees you from many maintenance problems and costs less to operate.

And it sells for a far lower price than any other nonelectric Diesel starter available today.

Your Diesel engine or equipment dealer can install an Aeroproducts Hydrostarter on your Diesel in just a few hours' time. He can give you full information—or quickly get it for you. See him today or write direct for full details.

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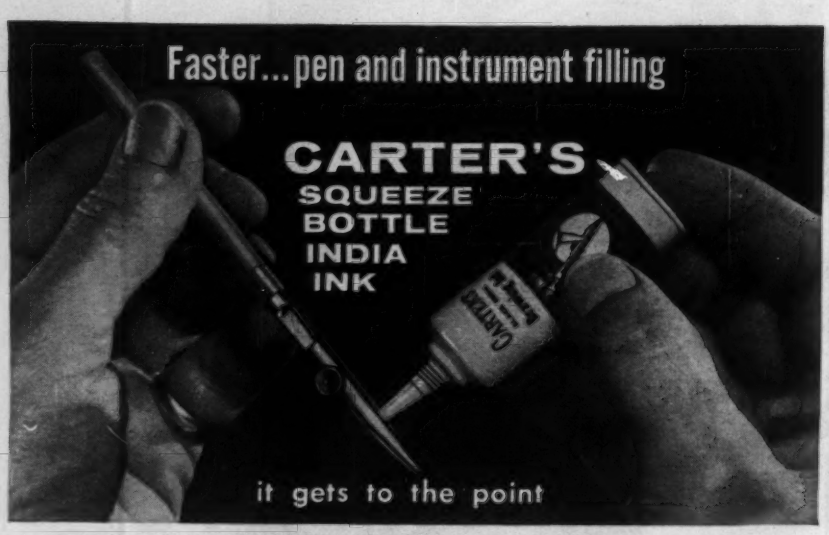

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(Continued from page 74)

Ill.—Eric Bolander Constr. Co., Winchester Rd., Libertyville, Ill., LB, $96,993. three I-beam bridges, frontage roads, Illinois-Michigan Canal U.S. 66, Will Co.;

Ill.—Standard Paving Co., 308 W. Washington St., Chicago 6, Ill., LB, $140,927, dual grade separation carrying U.S. 66 over Meterial Service Co. R.R., Will Co. Bids Nov. 1. CD 10/19.

▲ ILLINOIS—Dpt. P. Wks. & Bldgs., Div. Hys., Centennial Bldg., Springfield,

Ill.—Princeville Stone Co., Princeville, Ill., LB, $130,062. bit. surf. tr. on grav. or crushed stone base 5.14 mi. F.A.S. 216, Henderson Co.; LB $227,611, bit. surf. on grav. or crushed stone base 3.96 mi. F.A.S. 415, Henderson Co.;

Ill.—Arcole Midwest Corp., 3225 Main St., Evanston, Ill., LB $2,255,270, c. conc. 7.62 mi. U.S. 66, Grundy Co.;

Ill.—Chas. Ind Co., Point Ave. R.R. 1, Rockford, Ill., LB $448,609. c. conc. 0.44 mi. and 0.28 mi. same on 4-ramps, F.A. 188 Rockford, Winnebago Co.;

Ill.—McCann & Co., Inc., 812 Reisch Bldg., Springfield, Ill., LB $367,436. c. conc. 0.5 mi. Ill. 143 and paved ramps, U.S. 66 for grade separation Madison Co.;

Ill.—O'Connor Constr. Co., 320 Reisch Bldg., Springfield, Ill., LB $362,240. c. conc. 0.5 mi. Ill. 140 and paved ramps to U.S. 66 hy. grade separation, Madison Co.;

Ill.—J-P Constr. Co., 1750 State St., Chicago Heights, Ill., LB $89,665, intersection imprvs. 4 locations S.B.I. 6 and 4A, Cook Co.;

Ill.—L & S Constr. Co., 5401 Harrison St., Chicago 44, Ill., LB $182,909. traffic control signals at 16 intersections, Cook Co.;

Ill.—Triangle Constr. Co., 480 N. Evergreen St., Kankakee, Ill., LB $426,459, bit. resurf. 2.11 mi. conc. base course 1.06 mi. and conc. base course wid'n. 0.71 mi. Ill. 148 Williamson Co.;

Ill.—Rockford Black Top Constr. Co., 1615 Westchester Dr., Rockford, Ill., LB $168,810. bit. 1.68 mi. FAS 90, Ogle Co.;

Ill.—R. A. Cullinan & Sons, Tremont, Ill., LB $98,977. bit. surf. 3.81 mi. F.A.S. 572, Mason Co.;

Ill.—M. Hoeffken Co. & Hoeffken Bros. Inc., 222 W "B" St., Belleville, Ill., LB $322,640 c. conc. 0.48 mi. U.S. 66, Madison Co.;

Ill.—S. J. Groves & Sons Co., 1104 W. Reynolds St., Springfield, Ill., LB $1,976,360. c. conc. 5.03 mi. U.S. 66, c. conc. 0.92 mi. U.S. 40, 1 grade separation, 1 railroad subway, Madison Co. Bids Nov. 1. CD 10/19.

▲ Herlihy Mid-Continent Co., 135 S. LaSalle St., Chicago, Ill., LB $3,915,582, est. $4,250,000 (10 bidders) 68 m. g. reservoir, part of filtration plant at Navy Pier, CHICAGO, ILL. City, City Hall, Chicago, Ill. Bids. Oct. 27. CD 10/3.

▲ MICHIGAN—State Hy. Dpt., Stevens T. Mason Bldg., Lansing,

L. A. Davidson, 213 E. St. Joseph St., Lansing, Mich. CA $1,149,785. bridge and approaches on M-39, F B1 of 34-82-22-51 C1-U, F 82-121 C1-U (F 429 1 and 2), Wayne Co. CD 10/26, under LB.

MICHIGAN—State Hy. Dpt., Stevens T. Mason Bldg., Lansing,

Cross & White, 3849 Three Mile Rd., N. E., Grand Rapids, Mich. CA $671,087, est. $700,000. road work 5.439 mi., IN 63-29 C8-RO, Oakland Co CD 10/26, under LB.

Chicago Bridge & Iron Co., 332 S. Michigan St., Chicago, Ill. CA $328,000 two 1,250,000 gal. elevated steel water tanks, GRAND RAPIDS, MICH. City, City Hall, Grand Rapids, Mich. Bids Oct. 11. CD 9/29.

BUILDINGS—LB & CA

▲ Livingston Gardens, Inc., 65½ E. Gay St., Columbus, O. Owner Builds. $4,500,000. 51 frame DWELLINGS, Dillon Dr., Astor Ave. and Elderwood Ave., COLUMBUS, OHIO.

▲ Sepper Constr. Co., 21565 Lorain Ave., Cleveland 26, O. Own Forces. $1,456,000. 62 HOMES, FAIRVIEW PARK, O.

▲ George Sheaf & Co., Inc., 449 Neilston St., Columbus, O. CA Approx. $2,000,000. substructure engine facility PLANT and ground level constr. work, LIMA, O. Ford Motor Co., 3000 Schaefer St., Dearborn, Mich. CD 6/14.

▲ R. B. Evans Constr. Co., 441 N. Walnut St., Springfield, Ill., LB $1,305,000. general contract, 2 JUNIOR HIGH SCHOOLS, SPRINGFIELD, ILL. School District No. 5, Springfield, Ill. CD 11/8/54.

▲ Rose-Hill Realty Co., 14601 E. Seven Mile Rd., Detroit, Mich. Owner Builds. $1,500,000. Clarkston Gardens, 110 ranch HOUSES, Clarkston, Peachtree and Waldron Sts., CLARKSTON, MICH.

▲ Henry Shanedling & Sons Corp., 2025 Nicollet Ave., Minneapolis, Minn. CA est. $7,500,000. SHOPPING CENTER, incl. 40 stores, 30 acre site, Wyoming Twp., GRAND RAPIDS, MICH. Rogers Plaza Shopping Center, E. M. Rogers, 16939 James Couzens Hy., Detroit, Mich.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

† Ark., Jacksonville—GYMNASIUM—BA 11/29—U. S. Eng., P. O. Box 867, Little Rock, gymnasium, Little Rock Air Force Base, ENG-030-50-56-21. Extended date. CD 10/14.

▲ Tex., Beaumont—DOCKS, etc.—BA 11/29—Port of Beaumont, c/o Port Comm., 1255 Main St., rebuild Dock No. 2 on southside of port $500,000; correcting Dock No. 2, on northside, $200,000; wrecking warehouse at Docks 3 and 4 and building new warehouse, $500,000; strengthening and modernizing Docks 3 and 4, $500,000. George J. Schaum-

(Continued on page 79)

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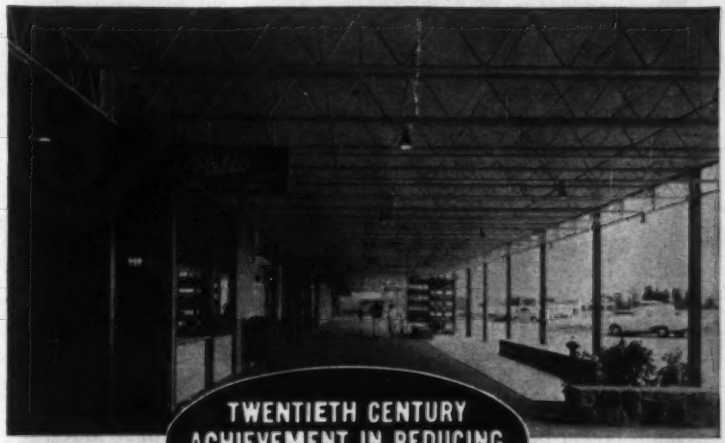

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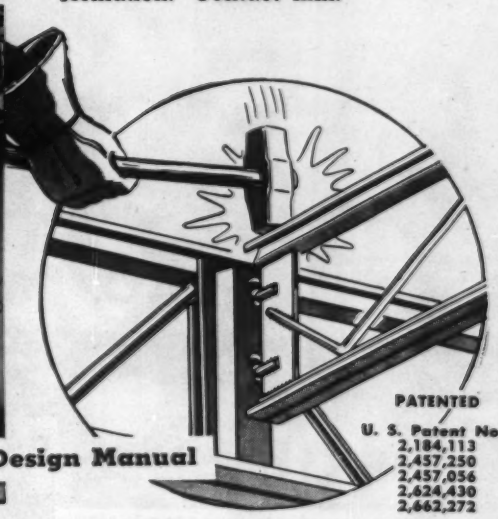

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(Continued from page 76)

burg, 2678 Laurel St., engr. CD 4/27, under Public Buildings.

BUILDINGS—BA

▲ **Tex., Dallas** — CLINIC SCIENCE — BA 11/29 — Southwestern Medical School, University of Texas, Main Bldg. 104, Austin, 8 story clinic science bldg., appurtenances. $3,500,000. Plans deposit $50. Mark Lemmon, 201 Thomas Bldg., archt. CD 3/22/54.

Minn., Two Harbors — HOSPITAL — BA 12/8 — Lake View Memorial Hospital, W. J. Detweiler, dir. Community Health Center, C. R. Magney, chn., Two Harbors, 1 story, 45x204 ft. hospital, $500,000, Ellerbe & Co., E. 505 First National Bank Bldg., St. Paul, archts. CD 9/22/54.

† **Okla., Oklahoma City**—ANIMAL LABORATORY—BA 12/13—Veterans Admin., Munitions Bldg., Wash., D. C. Animal Laboratory Bldg. No. 13, Veterans Administration Hospital.

HEAVY CONSTRUCTION—LB & CA

▲ **MISSOURI**—State Hy. Dpt., Jefferson City, Mo.—**Stupp Bros. Bridge & Iron Co.**, 3800 Weber Rd., St. Louis, Mo. LB $2,057,958 (3 bidders) structural steel in main truss spans Missouri River Bridge, St. Louis and St. Charles Counties; LB $1,916,334 (3 bidders) structural steel in east and west approach spans Missouri River Bridge, St. Louis and St. Charles Counties.

Mo.—**Mary Constr. Co., Inc.**, P. O. Box 423, Cape Girardeau, Mo. LB $395,842 (6 bidders) east approach substructure Missouri River Bridge, St. Louis and St. Charles Counties;

Mo.—**Fruin-Colnon Cont. Co.**, 1706 Olive St., St. Louis, Mo. LB $362,222 (6 bidders) west approach substructure Missouri River Bridge, St. Louis and St. Charles Counties. Bids Oct. 28. CD 8/26.

▲ **MISSOURI**—State Hy. Dpt., Jefferson City, Mo.—**Bushman Constr. Co.**, 4635 Wyandotte St., Kansas City, Mo. LB $1,456,516. c. conc. 4.599 mi. Laclede Co.;

Mo.—**A. E. Allcorn**, Mountain Grove, Mo. LB $74,297. (5 bidders). grav. or crushed stone surf. 11.078 mi. Douglas Co.;

Mo.—**Chappell Constr. Co., Inc.**, DeSoto, Mo. LB $79,295 (5 bidders) grav. or crushed stone surf. 5.955 mi. Franklin Co.;

Mo.—**Davis Constr. Co., Inc.**, Sixth and Spring Sts., Boonville, Mo. LB $93,887 (8 bidders) grav. or crushed stone surf. Calloway Co.;

Mo.—**Thompson Asphalt Co.**, Sixth and McCambridge Sts., Madison, Ill. LB $145,682 (7 bidders) shouldering, b. conc. 10.92 mi. Cape Girardeau Co.;

Mo.—**Peter Kiewit Sons Co.**, 1024 Omaha Nebraska Bank Bldg., Omaha, Neb. LB $217,780 (4 bidders) c. conc. 0.275 mi Jasper Co.; LB $328,492 (4 bidders) c. conc. 1.512 mi. Jasper Co. Bids Oct. 28. CD 10/12.

▲† **Charles Harris Plumbing Co.**, 474 University Ave., St. Paul, Minn., LB $1,294,700, central heating plant; high temperature hot water distr. sys., Minot Air Force Base, Inv. 25-066-56-35, MINOT, N. D. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids Nov. 1. CD 10/19.

† **Lippert Constr. Co.**, Boone, Iowa, CA $889,430. dormitories, mess and PX sales store, Minot Air Force Base, Inv. 25-066-56-2, MINOT, N. D. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids Oct. 27. CD 11/1, under LB.

† **Lovering Constr. Co.**, 59 W. Kellogg Blvd., St. Paul, Minn. and **O. J. Eickhof & Sons**, Crookston, Minn., CA $819,977, hangars and operations bldg., Minot Air Force Base, Inv. 25-066-56-1, MINOT, N. D. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids Oct. 25. CD 11/2, under LB.

▲† **Peter Kiewit Sons Co.**, Omaha Natl. Bank Bldg., Omaha, Neb., CA $1,645,466, Schedule 1, roads and utilities, Minot Air Force Base, Inv. 25-066-56-17, MINOT, N. D. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids Oct. 26. CD 10/31, under LB.

† **Northwestern Engineering Co.**, 1311 St. Joe St., Rapid City, S. D. CA $453,293. Est. $459,881 apron paving and taxiway lighting, Glasgow Air Force Base, Inv. 56-11, GLASGOW, MONT. U. S. Eng., City-County Airport, Walla Walla, Wash. Bids Nov. 1. CD 9/28.

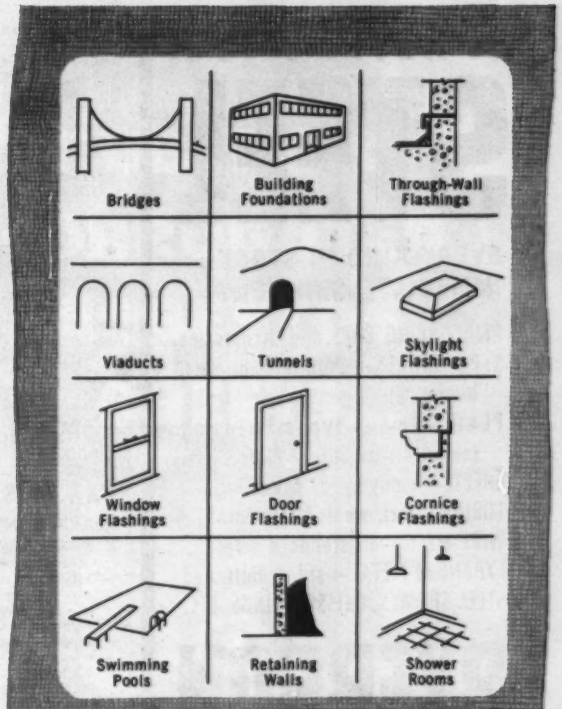
BUILDINGS—LB & CA

▲ **Foster Wheeler Corp.**, 165 Broadway, New York 6, N. Y. CA dual circulation reheat steam GENERATOR for Unit 3 Meramec Plant, ST. LOUIS, MO. Total est. cost $35,000,000. Union Electric Co. of Missouri, 315 N. 12 Blvd., St. Louis 1, Mo., CD 2/18/55; **General Electric Co.**, River Rd., Schenectady, N. Y. CA turbine (St. Louis, Mo.).

Strategic Metals Mining Co., Inc., c/o Max Skeer, Commerce Bldg., Kanas City, Mo. Owner Builds. Est. $750,000. SUPER DRUG STORE on site fronting 671 ft. west side Riverview Blvd. at Goodfellow Circle, ST. LOUIS, MO. Katz Super Drug Stores, S. A. Francis, distr. mgr., 700 Locust St., St. Louis 1, Mo., lessee. CD 5/13, under Duke-Young, Inc., as owner.

Midwest Piping Co., 1450 S. 2 St., St. Louis, Mo. CA $717,481, piping sys. for Unit 2 at North Omaha POWER PLANT, OMAHA, NEB. Omaha Public Power Dist., 17 and Harney Sts., Omaha, Neb. Bids Oct. 27. CD 11/1, under LB.

▲ **Tulsa Rig, Reel & Mfg. Co.**, Philtower Bldg., Tulsa, Okla. CA Est. $1,400,000. 100,000 sq. ft. WAREHOUSE Bldg. and HEADQUARTERS at Peoria and Frisco Sts. TULSA, OKLA. Jones & Laughlin Steel Corp., Supply Div., 108 N. Trenton St., Tulsa, Okla



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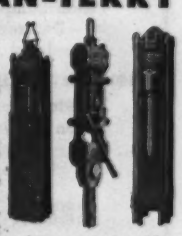

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Black & West, Tri-State Bldg., Tulsa, Okla. archts. CD 4/19.

Inwood Constr. Co., 507 Trinity Universal Bldg., Dallas, Tex., CA $524,925, mens' DORMITORY, DALLAS, TEX. Southern Methodist University, Dallas, Tex. Bids Oct. 17. CD 10/27, under LB.

General Constr., Co., Merc. Comm. Bldg., Dallas, Tex. Own Forces. $378,000, 18 DWELLINGS, DALLAS, TEX. CD 9/2.

Ponsford Brothers, Box 1412, El Paso, Tex. CA $585,000. JUNIOR HIGH SCHOOL TECHNICAL UNIT, EL PASO, TEX. El Paso Independent School Dist., 1000 W. Rio Grande St., El Paso, Tex. CD 9/8.

▲ **J. M. Odom**, P. O. Box 774, Austin, Tex., LB $1,312,752 North Side Junior High SCHOOL; South Side Junior High SCHOOL; Dunbar High SCHOOL addn. and Crestview Elementary SCHOOL addn., TEMPLE, TEX. Temple Independent School Dist., Temple, Tex. Bids Nov. 2. CD 10/20.

W. C. Shelton Constr. Co., Box 405, Lawton, Okla., CA $719,500. JUNIOR HIGH SCHOOL, WICHITA FALLS, TEX. Wichita Falls Independent School Dist., Wichita Falls, Tex. Bids Oct. 27. CD 10/5.

▲ **Rob. E. McKee General Contractor, Inc.**, Box 1706, Santa Fe, N. M. CA $1,492,546. (Phase 4). PENETENTIARY BLDGS. and facilities, SANTA FE, N. M. Bd. Comrs. Penetentiary of New Mexico, Santa Fe, N. M. CD 11/1, under LB.

FAR WEST

HEAVY CONSTRUCTION—BA

▲ **Washington-Oregon-Idaho**—GAS SYSTEM—Bids Asked—Cascade Natural Gas Corp., Securities Bldg., Seattle 1, Wash., installing pipe for natural gas distr. systems in Lewiston, Idaho; Baker and Pendleton, Ore.; Walla Walla, College Place, Clarkston, Kennewick, Prosser, Grandview, Sunnyside, Toppenish, Granger, Zillah, Wapato, Yakima, Wenatchee, Anacortes, Burlington and Bellingham, Wash. Part of $11,000,000 project. Plans deposit $100. Fish Service & Management Corp., M & M Bldg., Houston 2, Tex., archts. CD 8/12.

BUILDINGS—BA

Wash., Wenatchee—SCHOOL—BA 12/6—School District 146, Wenatchee, 5 brick, concrete 90,000 sq. ft. Junior High School bldgs. $900,000. Plans deposit $50. Extended date. Naramore, Bain, Brady & Johanson 904 7 Ave., Seattle, and A. Erickson, Central Bldg., Wenatchee, archts. CD 11/1.

HEAVY CONSTRUCTION—LB & CA

† **Hadden-Stewart Co.**, 712 E. 9 St., Tucson, Ariz., CA, $236,400. airmen's dormitory, mess, Gila Bend Air Force Auxiliary Field, ENG-04-353-55-182, GILA BEND, ARIZ. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. CD 9/1/54.

▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento, Calif.—**Lew Jones Constr. Co. & Leo F. Piazza Paving Co.** 1535 South 10 St., San Jose, Calif., LB, $1,535,052 (6 bidders) addnl. 39 ft. roadbed 1.9 mi. and 5 bridges for 4-lane divided freeway on Bayshore Hy., Santa Clara Co. CD 10/10.

Calif.—**Guy F. Atkinson Co.**, 10 West Orange Ave. South San Francisco, Calif., LB, $1,294,763. (7 bidders) grading, surf. 2 mi. U. S. 99 between Crespos and Vollmers, Shasta Co. Bids Nov. 2. CD 10/7.

† **Price-McNemar Constr. Co.**, P.O. Box 544, Sepulveda,, Calif., CA, $747,868. tactical and administrative facilities,, Special AAA LA-40, Long Beach, Los Angeles Co., ENG-04-353-56-32. CALIFORNIA. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids Oct. 12. CD 10/17, under LB.

▲ **Peter Kiewit Sons Co.**, 1024 Omaha National Bank Bldg., Omaha 2, Neb., and **Fredericksen & Kasler**, 212 13 St., Sacramento, Calif., CA, $3,960,482. propulsion engine test facilities, Edwards Air Force Base, ENG-04-353-56-1 (NEG), MUROC, CALIF. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Awarded Oct. 31. CD 6/1.

BUILDINGS—LB & CA

▲ **Howard S. Wright & Co., Inc.**, 414 Pontius St., Seattle, Wash., LB, $12,000,000. PAPER MILL and PAPER BAG CONVERTING PLANT on San Joaquin River, near ANTIOCH, CALIF. Crown-Zellerbach Corp., 343 Sansome St., San Francisco, Calif. CD 9/22 and 5/13.

C. V. Holder, 722 W. 99 St., Los Angeles, Calif., LB $458,274. (6 bidders) Arroyo HIGH SCHOOL addns., EL MONTE, CALIF. El Monte Union High School Dist., 630 S. Tyler Ave., El Monte, Calif. Bids Oct. 27. CD 10/14.

J. & A. Constr. Co., 11324 Magnolia Ave., North Hollywood, Calif., LB, $407,473, est. $360,000 (8 bidders) Sunny Brae Ave. SCHOOL, Canoga Park, LOS ANGELES, CALIF. Los Angeles Bd. Educ., 1425 S. San Pedro St., Los Angeles, Calif. Bids Oct. 28. CD 10/21.

▲ **Steed Brothers**, Box 351, Alhambra, Calif., LB, $1,318,400, (8 bidders), mens' and women's DORMITORIES, and DINING HALL addn., LOS ANGELES, CALIF. Occidental College, 1600 Campus Rd., Los Angeles, Calif. Bids Oct. 28. CD 10/17.

▲ **M & K Corp.**, 405 Montgomery St., San Francisco, Calif., LB, $2,866,000 (4 bidders) Luther Burbank SCHOOL, SAN FRANCISCO, CALIF. City and San Francisco Co., Dpt. P. Wks., City Hall, San Francisco, Calif. Bids Nov. 2. CD 9/28.

Bennington & Smith, Box 781, Apple Valley, Calif., LB $511,600. (6 bidders) 29-bed, 15,000 sq. ft. HOSPITAL, VICTORVILLE, CALIF. Desert Valley Hospital Corp., c/o J. Dewey Harnish, archt., 222 E "B" St., Ontario, Ont. Bids Oct. 27. CD 10/12.

CANADA

BUILDINGS—BA

B. C., Nanaimo—SCHOOL—BA 11/22—School Dist. No. 68, Nanaimo, 2 story frame Junior High School in South Nanaimo $500,000. Plans deposit $100. McArravy & Barley, 495 Dunsmuir St., archts.

HEAVY CONSTRUCTION—LB & CA

BRITISH COLUMBIA—B. C. Govt., Parliament Bldgs., Victoria,

Dawson, Wade & Co. Ltd., 775 Clark Dr., Vancouver, B. C., LB $571,301. reconstr. 7.65 mi. southern transprovincial hy., Cranbrook area. Bids Oct. 27. CD 10/20.

BRITISH COLUMBIA—B. C. Govt., Parliament Bldgs., Victoria,

Northern Constr. Co. & J. W. Stewart Ltd., 1304 Hornby St., Vancouver, B. C., LB, $493,145. Harrison River Bridge on Lougheed Hy., Dewdney Electoral District, Bridge Proj. No. 175, Harrison River. Bids Oct. 19. CD 10/14.

Horton Steel Works Ltd., 25 Adelaide St. W., Toronto, Ont. CA, $992,750. supplying, installing steel conduit and penstocks for Upper Campbell Lake hydro-electric development, BRITISH COLUMBIA. British Columbia Power Comn., Box 500, Victoria, B. C. Awarded Oct. 25. CD 7/18.

Northern Constr. Co. & J. W. Stewart Ltd., 1304 Hornby St., Vancouver, B. C., CA, $305,184. extending Whatshan hydro-electric development on Low Arrow Lake, BRITISH COLUMBIA, B. C. Power Comn., Victoria, B. C. Awarded Oct. 25.

BRITISH COLUMBIA—B. C. Govt., Parliament Bldgs., Victoria,

Dawson, Wade & Co. Ltd., 775 Clark Dr., Vancouver, B. C., CA, $581,333, Proj. 649. 6.54 mi. Okanagan Hy. from Lot 422-Deep Creek Section. N. M. McCallum, Parliament Bldgs., Victoria, engr. Awarded Oct. 28.

BUILDINGS—LB & CA

Diamond Constr. Co. Ltd., 60 Carlton St. Fredericton, N. B., CA, $830,000. (9 bidders) T-shaped, part bsmnt., 3 story above grade 535,000 sq. ft. rein.-con. CHEMISTRY BLDG., FREDERICTON, N. B. University of New Brunswick, College Hill, Fredericton, N. B. Bids Aug. 16, awarded Oct. 26. CD 7/27.

Olmsted & Parker Constr. Co. Ltd., 121 Shaw St., Hamilton, Ont., CA, $373,800 (11 bidders) 1 story, bsmnt., 76x242 ft., steel, brick masonry COUNTIES' BLDG., COBOURG, ONT. United Counties of Northumberland and Durham, Cobourg, Ont. Awarded Oct. 28. CD 6/9.

S. Stone, 51 Old Park Rd., Toronto, Ont. Owner Builds. $384,000. 3½ story, masonry, steel, rein.-con. APARTMENT, 159-161 Balliol St., TORONTO, ONT. E. I. Richmond, 455 Spadina Ave., Toronto, Ont., archt.

▲ **F. A. Tucker (Canada) Ltd.**, 400 St. James St. W., Montreal, Que., CA Total est. $20,000,000. preparatory work on nickel smelter PLANT, incl. access road, timber crib cofferdam, diversion channel, relocation of water mains, demolition of old bldg., CHICOUTIMI, QUE. Eastern Smelting & Refining Co., Ltd., 137 Wellington St. W., Toronto, Ont. Montreal Eng. Co. Ltd., 244 St. James St. W., Montreal, Que., engr. Awarded Oct. 28. CD 8/22.

LATIN AMERICA

HEAVY CONSTRUCTION—BA

† **Cuba, Guantanamo Bay**—DISPENSARY, SHOP—BA 12/8— Dist. P. Wks. Office, 10th Naval Dist., U. S. Naval Station, San Juan, Puerto Rico, (a) 1 story 5-bed dispensary bldg., U. S. Naval Air Station, Leeward Point, (b) 1 story, 54x100 ft. with approx. 20x40 ft. wing, AUW shop bldg. at Main Side, Naval Base, NOY 87348, Spec. Nos. 43463 and 43480. Plans deposit $50.

U. S. POSSESSIONS

HEAVY CONSTRUCTION—BA

▲† **Okinawa**—AIR BASE—BA 12/9—U. S. Eng., Okinawa District, APO 331, San Francisco, Calif., runway extens. highway relocation and petroleum tank farm, Kadena Air Base. $2,000,000. The San Francisco District office has plans and specifications for the work scheduled. CD 9/25/51 under Public Buildings.

Proposed Projects

WATER SUPPLY

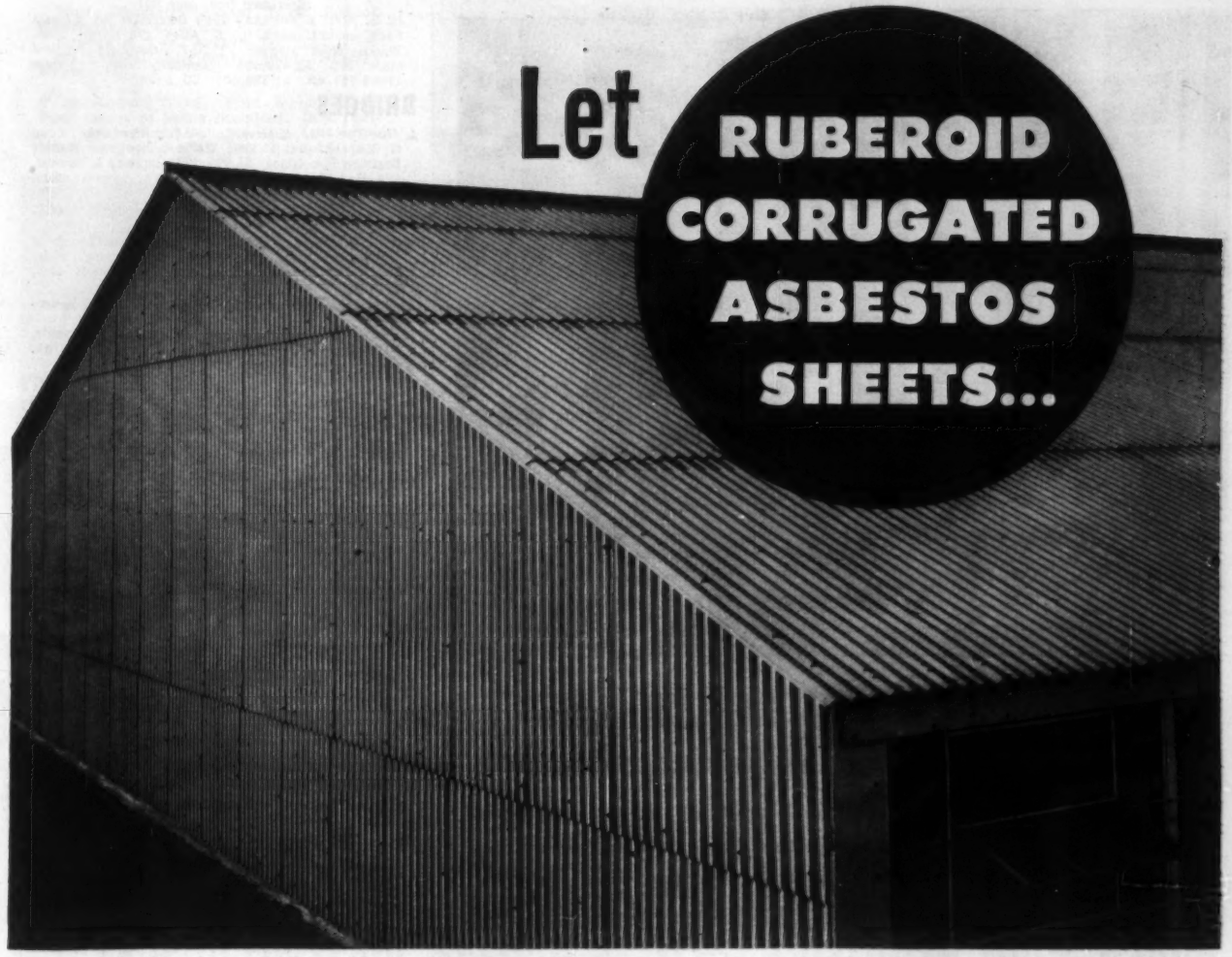
▲ **Ky., Owensboro**—City, WW Imprv., 6 addnl. wells, pipe connections, with treatment plant, pumping plant, install 20 and 12 in. water mains in south end of city, 38 fire hydrants. $1,300,000, Black & Veatch, 4706 Broadway, Kansas City, consult. engrs.

SEWERS, WASTE DISPOSAL

▲ **Mich., Wayne**—Nankin Twp., William Van Meter, superv., 3030 Wayne Rd., sewerage sys., 13 mi. sanitary sewers, Nankin, $1,045,000.

▲ **Ont., Toronto**—Municipality of Metropolitan Toronto, 67 Adelaide St. E., Imprv. Black Creek to provide a proper flow for new 9-foot storm sewer. $3,800,000.

(Continued on page 82)



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ST. LOUIS 15, MO.—9215 Riverview Dr.
DENVER 16, COLO.—156 W. 56th Ave.
KANSAS CITY 3, MO.—7600 Truman Rd.
SALT LAKE CITY, UTAH—1674 Beck St.

ASPHALT AND ASBESTOS BUILDING MATERIALS

(Continued from page 80)

H. G. Acres & Co. Ltd., 1259 Dorchester Rd. Niagara Falls, consult. engrs. L. B. Allen, c/o owner, comr. Works. Work planned 1955-57, immediate required stage est. $2,420,000; eventually required stage (1958-75) est. $1,380,000. CD 6/28.

BRIDGES

▲ New York—Bd. Supervs. Suffolk Co., Riverhead, 12,000 ft. bascule span, 2 lane, traffic bridge over Mastick Beach to Fire Island, $1,999,000. Hardesty & Hanover, 101 Park Ave., New York, Zone 17, consult. engrs. Bids in November. CD 4/29/54.

▲ ILLINOIS—Illinois State Toll Highway Comn., Springfield,
first three sections Tri-State Toll Road, from Chicago to Wisconsin border; from Chicago to Indiana border and from Hinsdale to Aurora, Ill. Bonds sold, $415,000,000. CD 11/22/54.

▲ ILLINOIS—Illinois State Toll Highway Comn., Springfield,
Tri State Toll Road. $415,000,000. Joseph K. Knoerle, 53 W. Jackson Blvd., Chicago, consult. engr. CD 10/31.

AIRPORTS

▲ O., Columbus—TERMINAL—City, City Hall, terminal bldg. addn., hangars, roads and parking, other imprvs. at Port Columbus, $7,068,000. To issue $3,975,000 in bonds, seeks remainder from federal government. CD 2/21/51.

▲† O., Dayton—LABORATORIES—U. S. Eng., P. O. Box 59, Louisville, Ky., plans by A. M. Kinney, Inc., 2905 Vernon Place, Cincinnati, Aeronautical Research Laboratories in Area B, 5-wing bldg. with porcelain enameled steel exterior, 1 and 2 story 100,000 sq. ft., Wright-Patterson Air Force Base. $3,000,000. CD 8/29.

▲† Tex., Randolph Field—DORMITORY—U. S. Eng., Santa Fe Bldg., Galveston, plans by Addis E. Noonan Assocs. & Jerry Rogers, achts.-engrs, 803 American Hospital & Life Insurance Bldg., San Antonio, two 3 story 399-airmen dormitories, Randolph Air Force Base. Over $5,000,000. CD 5/2/51.

LATIN AMERICA

▲ Mexico, Nuevo Laredo—National Railways of Mexico, J. E. PerezG, ch. engr. Maintenance and Ways, Mexico City, plans railway terminal completion. $1,000,000.

PUBLIC BUILDINGS

▲ Calif., Compton—SCHOOLS—Compton Elementary School Dist., 604 S. Tamarind St., voted $1,800,000 bonds, schools. CD 7/27.

▲ Calif., Mill Valley—SCHOOL—Tamalpais Union High School Dist., Tamalpais High School, Mill Valley voted $2,300,000 bonds school, Larkspur.

▲ Calif., Santa Ana—SCHOOLS—Santa Ana School Dist., 1415 French St., $7,722,000 bond election Feb. 7, schools. CD 6/15/53.

▲ Colo., Sterling—SCHOOL—School Dist. No. 12, Sterling, 2 story, brick high school. $1,400,000. Bonds to be voted in November. Atchison & Kloverstrom, 256 Josephine St., Denver, consult. engrs.

▲ Fla., Miami—SCHOOLS—Dade Co. Bd. Educ., 275 N. W. 2 St., voted $34,500,000 bonds 17 elementary schools, 8 high schools for three-year program.

▲ Ill., Evanston—SCHOOL—School Dist. 69, 1323 Hinman St., plans by Perkins & Will, 309 W. Jackson Blvd., Chicago, Zone 6, Junior High School, Greenwood and McDaniel Aves. $1,750,000.

▲ Kan., Merriam—SCHOOL—Shawnee-Mission District High Schools, 7401 Johnson Drive, plans by Neville, Sharp & Simon, 12 and Walnut Street Bldg., Kansas City, Mo., and Perkins & Will, assoc. archts., 309 W. Jackson St., Chicago, Ill., Senior High School, 75 and Mission Rd. $1,000,000.

▲ Mich., Ann Arbor—DORMITORY—University of Michigan, Bd. Regents, W. K. Pierpont, vice pres., Service Bldg., Ann Arbor, dormitory, University of Michigan, $4,000,000.

▲ Mich., East Detroit—SCHOOL—City, Bd. Educ., voted $3,500,000 bonds Oct. 21, two elementary schools, $400,000 each, 3 school addns. CD 10/18.

▲ Mich., St. Clair Shores—SCHOOL—Bd. Educ., Lake Shore Dist., C. H. Biefield, supt., voted $1,500,000 bonds Oct. 24, schools. CD 10/18.

▲ Mo., Normandy (St. Louis 21 P.O.)—SCHOOL—Normandy School Dist., Bd. Educ., Ward E. Barnes, supt., 7837 Natural Bridge Rd., Zone 21, voted $2,350,000 bonds Oct. 25, schools, addns., imprvs. Kenneth E. Wischmeyer, Bd. Educ. Bldg., 911 Locust St., St. Louis, Zone 1, archts. CD 9/15.

▲ N. J., Bridgeton—SCHOOL—Bridgeton Bd. Educ., plans by Edwards & Green, 17 S. 5 St., Camden, Senior High School. $1,000,000. CD 10/7.

▲ N. Y., Brooklyn—HEALTH CENTER—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, plans by H. V. Murphy, 1 Hanson Place, Zone 17, Proj. HL-26 Bushwick District Health Center, Central Ave. and Grove St. for Dpt. Health. $1,000,000. CD 12/8/54.

▲† N. Y., Jamestown—POST OFFICE and COURT HOUSE—General Services Admn., Public Bldgs. Service, 19 and F Sts. N. W., Wash., D. C., plans by Duane Lyman &. Assoc., 505 Delaware Ave., Buffalo and Beck & Tinkham, Bailey Bldg., Jamestown, post office and court house as a lease-purchase proj. $1,840,000. CD 12/2/49.

▲ N. Y., Plainedge—SCHOOL—Bd. Educ., Plainedge, high school, $4,500,000. Referendum vote on Nov. 5.

(Continued on page 84)

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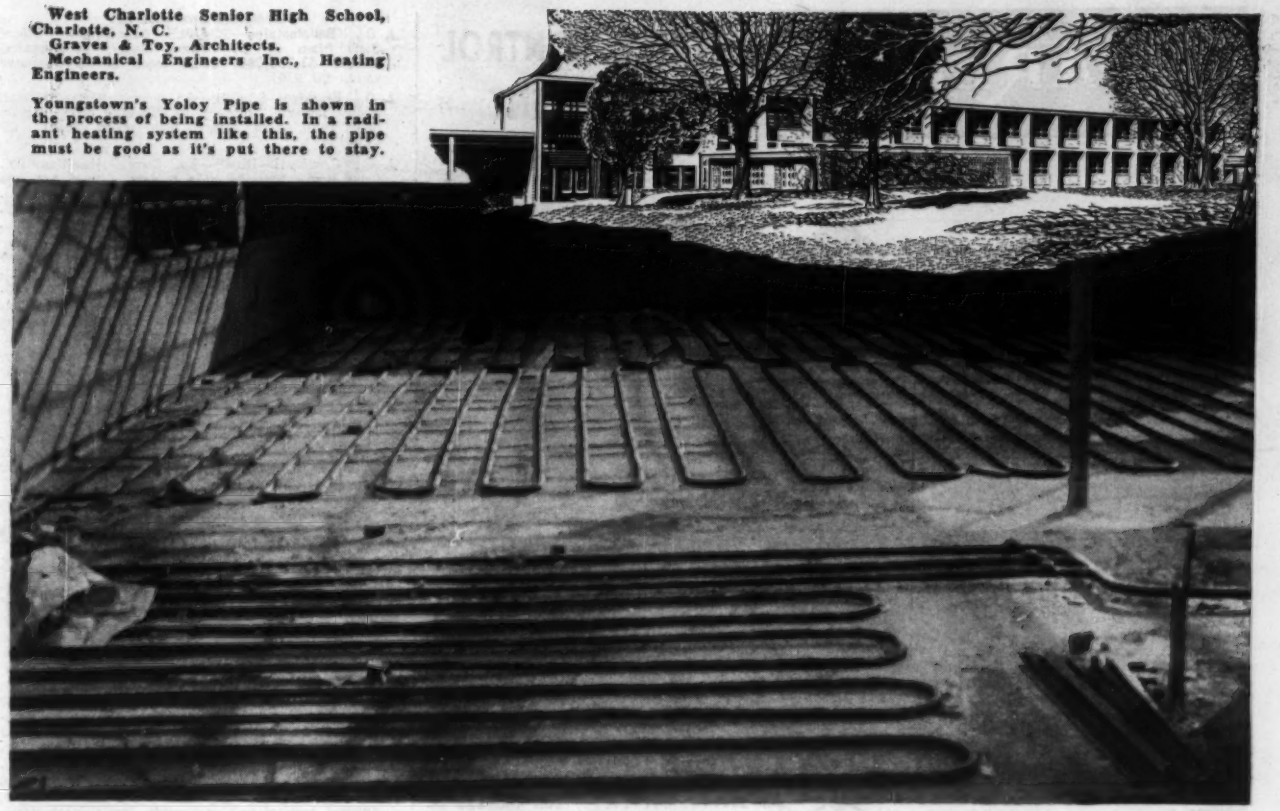

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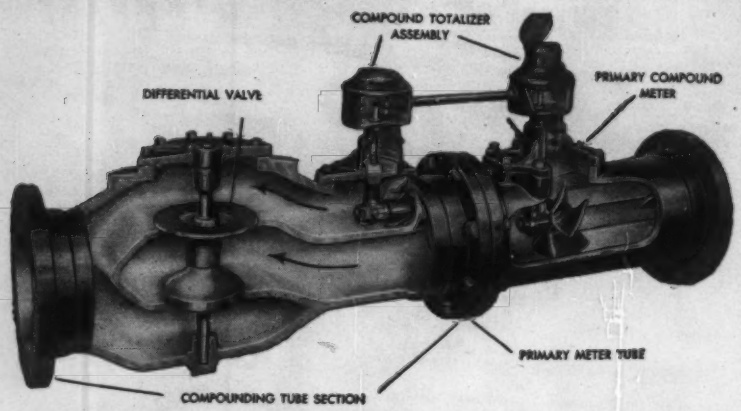

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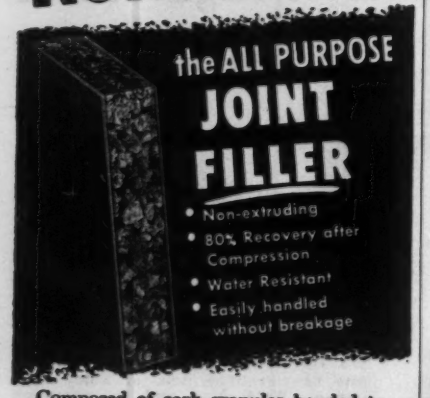

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(Continued from page 82)

▲ O., Bellefontaine—SCHOOLS—Bellefontaine School Dist. Plans by W. Howard Manor, Bellefontaine, schools, $1,250,000. Bonds voted in May declared valid. CD 5/9.

▲ O., Brooklyn—SCHOOL—Bd Educ., 9700 Biddulph Ave., Cleveland, Zone 9, $1,300,000 bond election May 1956, high school, high school addns. CD 4/14/53.

▲ O., Cincinnati—HOME—Bd. Comrs. Hamilton Co., Court House, plans by Hake & Hake, Gilbert Ave. and Samuel Hannaford & Sons, Dixie Terminal Bldg., constr., Hamilton County Home addns. $3,000,000. Bodenstein & Schuster, Second National Bank Bldg., consult. engrs. Bids early in 1956. CD 3/11/25.

▲ Okla., Stillwater—AGRICULTURAL—Oklahoma A & M College, Stillwater, plans by Phillip Wilbur, Stillwater, agricultural bldg. $1,000,000. CD 12/31/48.

▲ Okla., Stillwater—PHYSICS—Oklahoma A & M College, Stillwater, plans by Phillip Wilbur, Stillwater, physics bldg. $1,500,000. CD 2/23/50.

▲ Ore., Eugene—SCHOOLS—Eugene School Dist., Eugene, voted bonds Oct. 20, High School and Junior High School. $3,000,000. CD 9/21.

▲ Pa., Ardmore—SCHOOL—Lower Merion School Dist., Ardmore, plans by Harbeson Hough Livingston & Larson, 117 S. 17 St., Phila., Junior High School, gymnasium, parking area, Narberth. $4,500,000. Chester I. Duncan, 225 S. 15 St., Phila., consult. engr. CD 11/5/54.

▲ Pa., Chester — MARINE TERMINAL — Jointure, c/o city of Chester, marine terminal. $10,000,000.

▲ Pa., New Castle—SCHOOL—Joint School Dist. of Scott, Hickory and Slippery Rock Twps., New Castle, plans by the The Thayer Co., 408 Greer Bldg., Junior Senior High School, near Harlonsburg. $1,000,000.

▲ Pa., Springdale—SCHOOL—Allegheny Valley Joint School Dist., plans by John A. Desmone, 903 Renshaw Bldg., Pittsburgh, 1 story, bsmnt., brick, block, steel Junior-Senior High School, bus garage and parking area, $1,500,000. Bids late this year. CD 2/4/54.

▲ Tex., Houston—SCHOOLS—Houston Independent School Dist., 1300 Capitol St., cancelled Nov. 19 bond election for schools, pending litigation questioning the constitutionality of the special act under which the district operates. $15,000,000. CD 10/31.

▲ Tex., Mexia—HOSPITAL—Bd. for Texas State Hospitals & Special Schools, 4405 Lamar Blvd., Austin, plans by George L. Dahl, 2101 N. St. Paul St., Dallas, 400-bed hospital unit and wards, Mexia State Hospital. $1,000,000. Walter C. Moore, c/o owner, superv. archt. CD 9/28.

▲ Tex., San Antonio—HOSPITAL—Childrens Hospital Foundation, Jack Judson, 131 Mary D St., plans by Phelps & DeWees & Simmons, 342 W. Woodlawn St., 5 story bsmnt., masonry 100-bed hospital unit for children. $1,500,000.

▲ Tex., San Antonio—SCHOOLS—San Antonio Independent School Dist., Lavaca and Water Sts., plans by Atlee B. & Robert M. Ayres, admin. archts., 342 W. Woodlawn St., Junior High School, Tampico and Calaveras Sts., $1,025,000; plans by Reginald Roberts, 2600 N. McCullough St., and R. Vander Stratten, 244 W. Olmos Sts., admin. archts., Nebraska St. Elementary School No. 7, $575,000. Phelps & DeWees & Simmons, 342 W. Woodlawn St., bd. archts. CD 5/25.

▲ Wash., Edmonds—SCHOOL—School Dist. 15, Edmonds, plans by Waldron & Dietz, 208 Columbia St., Seattle, Zone 4, high school $2,100,000. CD 6/8.

▲ Wash., Olympia—STATE OFFICE—State Dpt. of Gen. Admin., Olympia, state office. $3,000,000. CD 10/7/54.

▲ W. Va., Charleston—City, City bldg., voted bonds, Charleston Civic Center, Reynolds St. $1,350,000. Irving Bowman, 317 Davidson Bldg., Charleston, archt. Bids about mid-January. CD 6/1.

▲ Wis., Green Bay—SCHOOL—Bd. Educ., 523 Howe St., plans by Foeller, Schober, Berners, Safford & Jahn, 310 Pine St., Junior High School. $2,000,000. Bids in March or April. CD 6/17/54.

▲ Wis., Mendota—PATIENT—State Dpt. P. Welfare, Madison, plans by Roger C. Kirchoff, state archt., patient buildings, $7,300,000. R. D. Culbertson, c/o owner, staff engr. CD 7/19/54.

▲ Wis., Superior—TRAINING SCHOOL—Bd. Regents of State College, Madison, plans by Foeller, Schober, Berners, Safford & Jahn, 310 Pine St., Green Bay, and M. R. Dobbermann, 1507 Tower Ave., Superior, 1 and 3 story, bsmnt., 153x394 ft., training school and science bldg. $1,500,000. CD 8/10/54.

▲† Alaska, College—CLASSROOM and LIBRARY, etc.—University of Alaska, College, plans by Manley & Mayer, Anchorage, 3 story rein.-con., steel classroom and library bldg. $2,250,000; gymnasium, $1,000,000. Work to begin in 1957. CD 7/2/51.

▲ Ont., Ottawa — FEDERAL — Dpt. P. Wks., Hunter Bldg., plans by Hart, Massey, Massey & Dirassar, 45 Rideau St. and A. E. Gardner, c/o owner, federal building for Dpt. Agriculture in Central Experimental Farm, $3,000,000.

COMMERCIAL BUILDINGS

▲ Calif., Canoga Park—DWELLINGS—Aldon Constr. Co., 9838 E. Belmont Ave., Bellflower, 236 frame, stucco dwellings, Saticoy and Shoup Sts. $2,500,000.

▲ Calif., Los Angeles—DWELLINGS—Kurtz Co., Inc., 13839 Ventura Blvd., Sherman Oaks, 90 frame, stucco dwellings, Mayall St., Granada Hills District. $1,000,000.

(Continued on page 86)

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(Continued from page 84)

▲ **Calif., North Highlands**—SHOPPING CENTER—M. J. Brock & Assocs., 2894 Rowena Ave., Los Angeles, plans by Dreyfuss & Davis, 2127 J St., Sacramento, shopping center, adjacent to Brock's Larchmont Village Subdivision in North Highlands, north of Sacramento. $6,000,000-$8,000,000.

▲ **Calif., San Diego**—DWELLINGS—Euclid Manor Co., c/o Western Drafting, 494 Newport Blvd., Newport Beach, 105 frame, stucco dwellings, Lot 15 of Rancho Mission. $1,000,000.

▲ **Calif., South San Francisco**—HOMES—Ceaser-Callan Development Co., 2790 Junipero Serra Blvd., Daly City, 200 home subdivision, $3,500,000.

▲ **D. C., Wash.**—MEMORIAL—National Guard Assoc. of U. S., 100 Independence Ave. N.W., memorial bldg., New Jersey Ave., 1 and H Sts. N.W. $1,500,000.

▲ **Ill., Chicago**—CHURCH—Queen of All Saints Church, 625 Sauganash St., plans by Meyer & Cook, 1915 Lincoln Ave., church, Sauganash and Keene Sts. $1,500,000.

▲ **Md., Hyattsville**—SHOPPING CENTER—Owner, c/o A. Rinaudot, archt., 7240 Wisconsin Ave., Bethesda, Greenlawn Shopping Center, New Hampshire Ave. and Eastern Ave., West Hyattsville. $1,000,000.

▲ **Md., Rockville** — SHOPPING CENTER — Arthur C. Hyde, Congressional Airport, plans by A. Rinaudot, 7240 Wisconsin Ave., Bethesda, Congressional Shopping Center, Rockville Pike. $2,000,000.

▲ **Mich., Pontiac**—HOSPITAL—St. Joseph's Mercy Hospital, Sister Mary William, administrator, Pontiac, plans by Smith-Hinchman & Grylls, Inc., 800 Marquette Bldg., Detroit, hospital addn., incl. psychiatric nursing unit. $4,000,000.

▲ **Mich., Southfield**—HOSPITAL, etc.—Providence Hospital, Richard E. Krafve, chn. Bd., 2500 W. Grand Blvd., Detroit, 9 story hospital, 5 story nurses home, Nine Mile Rd. and Greenfield St. $8,000,000.

▲ **Minn., Hoyt Lakes**—HOUSING—Partridge Lakes Development, Hoyt Lakes, 300 houses, 200 to go ahead on or before Jan. 1, 1957, 200 on or before Apr. 1, 1957, 100 on or before Jan. 1, 1958, $1,000,000.

▲ **Minn., Minneapolis**—BANK—First National Bank of Minneapolis, G. Murray, pres., Fifth St. and Marquette Ave., plans by Thorshov & Cerny, 400 Metropolitan Blvd., and Holabird, Root & Burgee, assoc. archts., 180 N. Wabash St., Chicago, Ill., bank in block between Fifth and Sixth Sts. south and Marquette and Second Aves. $2,000,000. CD 8/26.

▲ **Mo., Liberty**—BUILDINGS—William Jewell College, Liberty, college addns., imprvs. $1,646,000. CD 12/9/52.

▲ **Neb., Omaha**—OFFICE—Mutual Benefit Health & Accident Assn., and United Benefit Life Insurance Co., 3316 Farnam St., plans by Tinsley, Higgins, Lighter & Lyon, 526 Liberty Bldg., Des Moines, Iowa, home office addn. $1,000,000.

▲ **N. Y., New York**—OFFICE—Joseph P. Blitz, Inc., 150 E. 39 St., Zone 16, 21 story office and showroom, east side of Broadway from 31 to 32 St. $5,000,000.

N. Y., New York—APARTMENT—Charles Tanenbaum, 349 E. 149 St., Zone 51, plans by A. Herbert Lilien, 201 W. 72 St., Zone 23, 6 story apartment, Van Courtland Park south between 239 St. and Review Place. $540,000.

▲ **O., Parma Heights**—SCHOOL—Catholic Diocese of Cleveland, 1027 Superior Ave., Cleveland, Zone 14, 2 story high school for Sisters of St. Joseph, on 18½ acre site of Snow Rd. near Parma Heights Blvd. $1,000,000.

▲ **Pa., Bala-Cynwyd** — OFFICE — One Bola Ave., Inc., 403 W. Woodlawn St., Phila., plans by Aaron Colish, 117 S. 17 St., Phila., office and parking, $1,000,000.

▲ **Pa., New Castle**—OFFICE—First Federal Savings & Loan Assoc., 101 E. Washington Ave., plans by Runeen Co., 1225 Vine St., Phila., and James Stevenson, assoc. archt., 609 Law Savings & Trust Bldg., 3 story, bsmnt., brick, steel office N. Nell St. and Sycamore Way. $1,000,000.

▲ **Pa., Upper Darby**—SCHOOL—R. C. Archdiocese of Phila., 310 N. 19 St., Phila., plans by Stickle & Assoc., 125 City Line Ave., Bala-Cynwyd, Father Bonner High School for Boys, $2,500,000. CD 6/29.

▲ **Tex., Corpus Christi**—SHOPPING CENTER—Parkdale Plaza Shoping Center, c/o Ben D. Marks, Abe M. Katz, & H. Weisman, Jones Bldg., plans by Irving R. Klein & Assocs., 1317 Austin St., Houston, regional shopping center, S. Staples and Gollihar Rd. area. $1,500,000.

▲ **Tex., Houston**—SHOPPING CENTER—Syndicate, c/o M. J. Wesfeldt, 2404 San Jacinto St., shopping and professional center, Griggs Rd., across from New Palmer Center. $3,500,000.

▲ **Va., Alexandria**—COMMERCIAL—Washington Development Corp., c/o Bob Duncan, 322 S. Washington St., plans by Willgoos & Chase, 300 Montgomery St., 7 story commercial bldg. in 300 block of N. Washington St. $2,500,000.

▲ **Wash., Quincy**—SHOPPING CENTER—Quincy Development Co., Inc., Quincy, shopping center, $1,000,000.

▲ **Ont., Toronto**—OFFICE—Tower Investment Corp. Ltd., 825 Eglinton Ave. W., plans by W. Shulman, 1173 Bay St., 12 story, penthouse, 50,000 sq. ft. office, 124 Richmond St. W. $1,000,000.

▲ **Que., Shawinigan South**—HOUSING—Owner, c/o Marcel Bouvette, 338 Rue des Cedres, Shawinigan Falls, plans by Central Mortgage & Housing Corp., 940 Cote de Liesse Rd., Mount Royal, Montreal, Zone 16, housing. $8,000,000. To start in 1956.

INDUSTRIAL BUILDINGS

▲ **Calif., Riverside**—PLANT OFFICES, etc.—California Electric Power Co., 3771 W. 8 St., plans by Austin, Field & Fry, 2311 3 St., Los Angeles, administrative and executive offices, shops, garage, Foothill Blvd. $2,400,000. CD 3/3.

▲ **Idaho, George**—MINE—Central Farmers Fertilizer Co., 608 S. Dearborn St., Chicago 5, Ill., phosphate mine, 6 mi. railroad tract by Union Pacific, $7,500,000.

▲ **Mich., Ypsilanti**—PLANT—Ford Motor Co., 3000 Schaefer St., Dearborn, 600,000 sq. ft. parts plant. $5,500,000.

▲ **Pa., Hatboro**—PLANT—V. LaRosa & Sons, Inc., Hatboro, mfg. plant expansion, $1,000,000.

▲ **Pa., West Mifflin**—PLANT—Shwayder Bros., Lebanon Church Rd., 2 story, masonry, and 1 story, steel 100,000 sq. ft. furniture mfg. plant addn. $1,000,000, Rust Eng. Co., 575 Sixth Ave., Pittsburgh, engr.

▲ **Utah, Delle**—MINE and PLANT—Material Service Corp., 300 W. Washington St., Chiago, Ill., dolomite mine and processing plant. $2,000,000.

▲ **Wis., Janesville**—FACTORY—General Motors Corp. General Motors Bldg., Detroit, Mich., plans by Boddy, Benjamin & Woodhouse, 28 W. Adams St., Detroit, Mich., 1 story, 240x565 ft., and 1 story L-shaped, 200,000 sq. ft. factory addns., $2,000,000.

▲ **Alta., Edmonton**—PLANT—Inland Cement Co. Ltd., Northgate Bldg., doubling capacity of plant. $4,000,000. Foundation of Canada Eng. Corp., Ltd., 1900 Sherbrooke St. W., Montreal, Que., consult. engrs.

UNCLASSIFIED

▲ **N. Y., Brooklyn**—PIERS—Port of New York Auth., 111 Eighth Ave., New York, 1st unit Pier 11, 2,000x270 ft. quay-type pier at Atlantic Basin, $7,000,000. Other work in seven year program.

Pier 1, L-shaped pier south of Brooklyn Bridge, with two berths along 1,030 ft. frontage and third on 570 ft. south side;

Pier 2, two-berth finger pier, 625x340 ft.;

Pier 3, two-berth finger pier, 625x340 ft.;

Pier 4, one-berth finger pier, 700x300 ft.;

Pier 5, two-berth finger pier, 625x340 ft.;

Pier 7, three-berth finger pier 725 ft. long on its north side, 1,100 ft. long on south side, 300 ft. wide;

Pier 8, two-berth finger pier, 750x300 ft.;

Pier 9, three-berth finger pier, 550x570 ft.;

Pier 10, two-berth finger pier on northwest side of Atlantic Basin, 700x320 ft.;

Pier 12, existing two-berth pier on southwest side of Atlantic Basin, 900x170 ft. Est. $85,000,000.

▲ **Okla., Tulsa**—PARKS and PLAYGROUND EXTENS.—City, City Hall, bond election Nov. 15, parks, playground extens. $1,000,000. W. R. Wooten, city engr. CD 3/5/52.

▲ **Alta., Calgary** — FOOTBALL STADIUM — City, City Hall, municipal football stadium, $2,000,000.

***Beaumont, Texas* installs Densludge Digestion and four 195' Dorrco Distributors**

Among the more unusual new installations in the United States is the 30 MGD Ultra-Modern Plant now serving Beaumont, Texas. Employing the Biofiltration flowsheet followed by Densludge Digestion, the plant is designed for a population load of 200,000 with room for expansion.

Unusual at Beaumont are four 195' Dorrco Distributors . . . among the largest ever manufactured. The primaries are rated at 15 MGD each under a head of 3.2 ft. while the secondaries handle 30 MGD *each* at a 2.75 ft. head. Also unique is the use of Densludge Digestion incorporating two Densludge Thickeners to concentrate the solids to 6-7½% prior to digestion.

As this new plant at Beaumont shows, there's a Dorr-Oliver unit for practically every step in every sewage treatment flowsheet. Write for a copy of Bulletin No. 6041 which covers the complete line.

Here's the equipment installed at Beaumont: 1 40' Dorr Detritor • 4 155' dia. Dorr Secondary Clarifiers 4 155' dia Dorr Primary Clarifiers • 2 195' Dorrco Primary Distributors • 2 195' Dorrco Secondary Distributors 2 50' dia. Dorr Densludge Thickeners • 1 80' dia. Dorr Multidigestion System • 6 Dorrco Plunger Pumps

Consulting Engineers: GEORGE J. SCHAUMBURG, Beaumont, Texas
Engineering Consultants: FORREST & COTTON, Dallas, Texas

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STAMFORD • CONNECTICUT • U.S.A.

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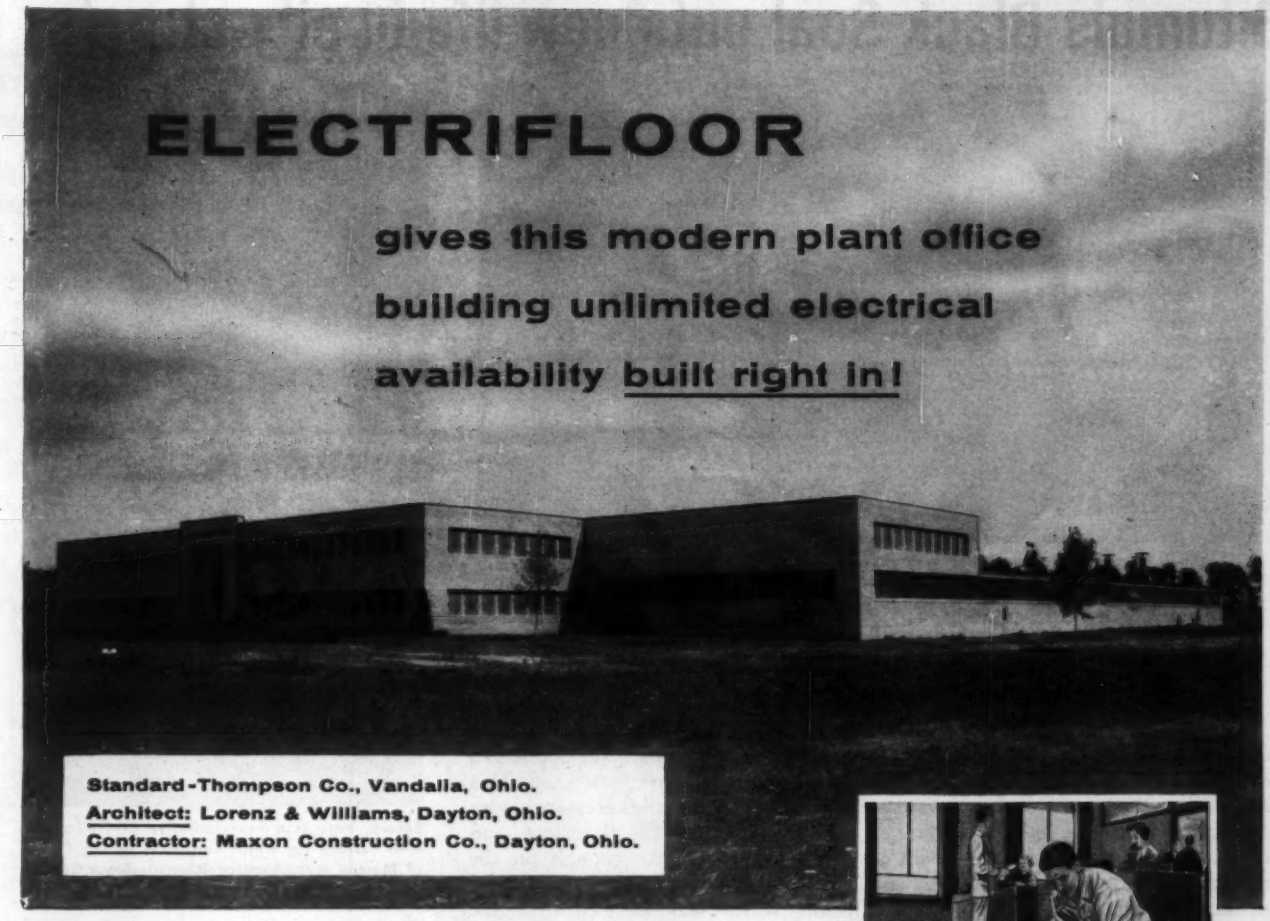
gives this modern plant office building unlimited electrical availability built right in!



Standard-Thompson Co., Vandalia, Ohio.
Architect: Lorenz & Williams, Dayton, Ohio.
Contractor: Maxon Construction Co., Dayton, Ohio.

This building can never become electrically obsolete because it is designed with Fenestra* Electrifloor†, the modern structural floor system with unlimited electrical availability *built right in!*

To plant management this means that new outlets for electrical, telephone and intercom service can be installed by plant maintenance men *any time* in any or every square foot of floor space. This reduces the costs of moving desks, installing new equipment and changing office layout. You don't have the interruptions and expense of tearing up walls and floors for new wiring.

And, you get this complete electrical flexibility *at less cost* than with other types of construction, because Electrifloor is a structural subfloor and electrical distribution system *all in one.* Foundation and structural steel costs are reduced. Your building is completed and you're in production faster.

To utilize all the advantages of Electrifloor, your building should be designed around it. Get complete details, now, *before* you start your plans. Write Detroit Steel Products Co., Dept. ER-11, 2286 E. Grand Blvd., Detroit 11, Michigan.

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NEPCO electrical header ducts connected to Fenestra cellular steel floor panels make it possible to use all the panel beam cells . . . *any time* . . . as wiring raceways. All you do is drill a hole, pull up the wires and connect the outlet! Electrifloor's exclusive 4" handhole openings and larger area cells make installation easier and avoid crowding wires.

Fenestra Nepco | ELECTRIFLOOR
TODAY'S FLOOR WITH A FUTURE...*UNLIMITED*

Bitumuls Black Seal puts new life in city streets

Bitumuls Black Seal, consisting of a single application of Bitumuls emulsified asphalt, puts new life in weathered pavement surfaces.

Engineers of Merced and Fresno, California, inspect pavement to be revitalized.

Before. Here is a representative dry, weathered surface for which Engineers of the City of Merced recommended Bitumuls Black Seal.

After. Notice the tight, uniform texture obtained by a single Black Seal application. No tendency toward fatness or bleeding.

Merced, California, treats 140,000 square yards at cost of $1050

A recent survey of residential streets in one section of Merced, California, indicated that the paved surfaces were starting to deteriorate at an alarming rate. Some were streets originally built of concrete and later resurfaced with a one-inch asphalt plant-mix overlay. Others were plant-mix surfacing on a rock base.

For those surfaces that were seriously cracked, broken or ravelled, specifications were drawn up calling for Bitumuls® Surface Treatments (either Single or Double, with chip-cover).

Preventive Maintenance Indicated

On many of the streets, however, the surfaces while still in relatively good condition were oxidized, dry and open-textured. The Engineers realized that unless some form of "preventive maintenance" were undertaken, these surfaces would soon require extensive repairs and possibly complete resurfacing. What they needed was a method of revitalizing these surfaces, plus the placement of additional binder to seal the interstices against water damage.

Bitumuls Black Seal Selected

After investigating several proposed methods, the Engineers decided on the use of Bitumuls Black Seal to rectify the situation. For this work 0.1 gal. per sq. yd. of (1:1) diluted Bitumuls SS-2 emulsified asphalt was applied to the surfaces. No cover was used. This treatment provided the necessary binder to adequately seal the pavement, and the coating was thin enough on the high spots to prevent pick-up under traffic which was allowed over the pavement within one hour.

Adaptable To Wide Application

Costs of the Black Seal work and for the other Bitumuls Surface Treatments are given in the table below.

Dry and open-textured paved surfaces are not peculiar to Merced. This method of economically extending pavement life merits investigation by communities in every part of the country. *Specifications on Black Seal, and on Bitumuls Surface Treatments, are available on request.*

COST SUMMARY

ITEM	I Black Seal	II Single Chip Seal with Black Seal	III Double Chip Seal with Black Seal
Labor (including Rock Haul)	$210	$168	$602
Bitumuls RS-1 at 10c per gal.		160	829
Bitumuls SS-2 at 11c per gal.	840	90	396
½" Crushed Rock at $2.35 per ton			668
⅜" Crushed Rock at $2.35 per ton		151	
¼" Crushed Rock at $3.35 per ton			450
Total Cost (labor & materials)	$1050	$569	$2945
Total Square Yards	140,000	6240	16,090
Cost per square yard (labor & materials)	$.0075	$.0913	$.183

Note: Cost does not include equipment rental.

AMERICAN Bitumuls & Asphalt COMPANY

200 BUSH STREET • SAN FRANCISCO 4, CALIFORNIA

E. Providence 14, R. I. Perth Amboy, N. J. Baltimore 3, Md. Mobile, Ala.
Cincinnati 38, Ohio Columbus 15, Ohio Tucson, Ariz. Seattle, Wash.
Baton Rouge 2, La. St. Louis 17, Mo. Inglewood, Calif. Oakland 1, Calif.
Portland 7, Ore. Washington 5, D. C. San Juan 23, P. R.

Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
November 21 Connecticut November 22 Massachusetts

HEAVY CONSTRUCTION—LB & CA

▲ **Wexler Constr. Co.,** 118 Needham St., Newton Highlands, Mass. CA **$1,164,000,** est. $1,100,000. Contr. 228 combination service station, snack bars and restaurants, Cumberland, Gray, Lewiston and Litchfield, MAINE. Maine Turnpike Auth., 17 Bishop St., Portland, Me. Howard D. Johnson Co., 89 Beale St., Quincy, Mass., lessee. CD 10/26, under LB.

▲ **NEW HAMPSHIRE**—State Dpt. P. Wks. & Hys., Concord,
Landers & Griffin, Inc., & Morrison-Knudsen Co., Inc., 800 Islington St., Portsmouth, N. H., LB **$1,748,159** (6 bidders) road mix hy. 2.1 mi. and constr. 5 steel beam bridges, Spaulding Turnpike, Dover. Bids Nov. 3. CD 10/25.

▲† **Massachusetts Northern Constr. Co.,** 588 Essex St., Lawrence, Mass. LB **$2,730,282.** Schedule 1, **$348,719.** Schedule 2, est. $2,000,000-$2,400,000. Hoosic River Basin Adams Flood Control Proj., Unit No. 4, Adams, CIVENG-30-075-56-5, MASSACHUSETTS. U. S. Eng., 111 E. 16 St., New York, N. Y. Bids Nov. 1. CD 10/13.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
November 22 New Jersey
STREETS AND ROADS
November 22 Maryland November 29 New Jersey

▲ **New York**—BA 12/8—Power Authority of the State of New York, 270 Broadway, New York, Zone 7, channel imprvs., Sparrowhawk-Toussaints Channel, near Ogdensburg, St. Lawrence Co., Spec. Pa-5-11007, St. Lawrence Contr. No. 22. Plans deposit $10. Uhl, Hall & Rich, 230 Congress St., Boston 10, Mass., engrs. CD 8/18/54.

▲† **New Jersey**—SPECIAL AAA FACILITIES—BA 12/14—U. S. Eng., 111 E. 16 St., New York 3, N. Y., Special AAA Facilities, FY 1955 program, Summit Serial No. ENG-30-075-56-187. $1,000,000-$1,250,000. Plans deposit $100.

BUILDINGS—BA

▲ **N. Y., Elmhurst**—SCHOOL—BA 12/6—Director Bureau Constr., 42-15 Crescent St., Long Island City, Zone 1, general constr. of new addn. C Wing to Newtown High School, 48-01 90 St. Plans deposit $15. CD 1/21.

▲ **N. Y., New York**—SCHOOL—BA 12/7—Director Bureau Constr., 42-15 Crescent St., Long Island City, Zone 1, general constr. Junior High School, 141 W. 236 and 237 Sts. and Independence Ave., Bronx Boro. $2,800,000. Plans deposit $30. CD 1/20.

▲ **N. Y., New York**—SCHOOL—BA 12/8—Director Bureau Constr., 42-15 Crescent St., Long Island City, Zone 1, general constr. Junior High School 143, W. 231 St., Sedgwick Ave. and Kingsbridge Terrace, Bronx Boro. $2,800,000. Plans deposit $30. CD 1/20.

HEAVY CONSTRUCTION—LB & CA

▲† **American Dredging Co.,** 12 S. 12 St., Phila., Pa., LB, **$2,356,900,** dredging Mantua Creek anchorage, Delaware River, Gloucester Co., NEW JERSEY. U. S. Eng. 2635 Abbottsford Rd., Phila., Pa. Bids Oct. 7. CD 9/15.

BUILDINGS—LB & CA

▲ **Berger-Tilles Projects,** 3000 Hempstead Turnpike, Levittown, N. Y. Owner Builds. **$1,000,000.** Brentwood SHOPPING CENTER on 3 acre tract at north side of Suffolk Ave. between Jefferson and Reese Aves., BRENTWOOD, N. Y. A. H. Salkowitz, 87-25 Homelawn St., Jamaica, N. Y., archt.

▲ **Oak Leasing Corp.,** c/o George Miller, archt., 125 W. 45 St., New York 19, N. Y. CA **$1,000,000.** 6 story APARTMENT, 62 Rd. and 108 St., ELMHURST, N. Y. CD 8/31.

▲ **TGK Constr. Co., Inc.,** 55 W. 42 St., New York 36, N. Y. LB **$2,219,500.** (3 bidders) general contract JUNIOR HIGH SCHOOL, 189 Barclay and Sanford Aves. and 147 St., FLUSHING, N. Y. Bureau Constr., 42-15 Crescent St., Long Island City 1, N. Y. Bids Nov. 7. CD 10/10.
Bank Electrical Co., 126 W. 32 St., New York 1, N. Y. LB **$358,750.** electrical work. (Flushing, N. Y.).

▲ **Corbetta Constr. Co., Inc.,** 220 E. 42 St., New York, N. Y. CA, general contract PLANT, HUDSON, N. Y. Lone Star Cement Corp., 100 Park Ave., New York, N. Y.

▲ **Birch Leasing Corp.,** c/o George Miller, archt., 125 W. 45 St., New York 19, N. Y. Owner Builds. **$1,000,000.** 6 story APARTMENT, 62 Rd. northwest corner of Yellowstone Blvd., FOREST HILLS, N. Y. CD 10/17.

▲ **Sam & Irving Rosoff,** 369 Lexington Ave., New York 17, N. Y. Owner Builds. **$1,000,000.** APARTMENT, 211-229 E. 18 St., NEW YORK, N. Y. CD 7/25.

▲ **Harbor Hills Estates, Inc.,** Port Jefferson, N. Y. Owner Builds. **$6,000,000.** 200 HOUSES, 18-hole golf course club house, boat basin on 350 acre tract at Cliff and Harbor Hills Rds., PORT JEFFERSON, N. Y. Herman York, 90-04 161 St., Jamaica, N. Y., archt.

▲ **Calvert Manor Homes,** c/o Long Island Homes, 168-12 Hillside Ave., Jamaica 32, Owner Builds. **$2,000,000.** 100 HOUSES on 60 acre tract, SYOSSET, N. Y.

▲ **Costanza Contg. Co.,** 6515 Crescent Blvd., Pennsauken, N. J., CA, **$1,204,900,** general contract JUNIOR HIGH SCHOOL, 7 St. and Erie Ave., CAMDEN, N. J. Bd. Educ., City Hall, Camden, N. J. Bids Oct. 13. CD 10/26, under LB.

▲ **Frank Briscoe & Co., Inc.,** 287 S. 19 St., Newark, N. J. CA Est. **$1,600,000.** 3 story, 60x450 ft. LABORATORY and OFFICE, Park and Linden Aves., LINDEN, N. J. Esso Standard Oil Co., 15 W. 51 St., New York, N. Y. Ralph T. Walker, 101 Park Ave., New York, N. Y., archt.

▲ **Point Pleasant Homes, Inc.,** Att. William Potter, Point Pleasant, N. J. Separate Contracts. **$1,820,000.** RESIDENTIAL DEVELOPMENT, Sunset Ave., etc., POINT PLEASANT, N. J. Robert H. Stuart, Belmar, N. J., archt.

▲ **Arno Corp.,** 2247 N. 51 St., Phila., Pa. Separate Contracts. **$1,250,000.** RESIDENTIAL DEVELOPMENT, David Rd., HAVERTOWN, PA.

▲ **Harry J. Gelsman,** 1611 Nedro Ave., Phila., Pa. Separate Contracts. **$2,000,000.** RESIDENTIAL DEVELOPMENT, Carter Rd., PHILA., PA.

▲ **A. Raymond Raff Co.,** 1635 W. Thompson St., Phila., Pa. LB **$1,080,000.** Women's DORMITORY, PHILA., PA. Temple University, Broad St. and Montgomery Ave., Phila., Pa. Bids Nov. 1. CD 10/13.

SOUTH

BUILDINGS—BA

▲ **Va., Arlington**—MEDICAL WING, etc.—BA 12/1—Arlington Hospital, 5129 16th St. N., 3 story medical wing, laundry and boiler plant, nurses home at present site. $1,000,000. Plans deposit $40. John M. Walton & Assoc., 2049 15th St. N., archts. CD 12/21/54.

▲† **Ala., Fort McClellan**—HOUSING—BA On Or About 12/15—U. S. Eng., 2301 Grant St., Mobile, 76-unit family housing, ENG-01-076-56-39. CD 8/18.

HEAVY CONSTRUCTION—LB & CA

▲† **Blythe Bros. Co.,** Box 989, Charlotte, N. C. LB **$3,482,838.** (4 bidders) constr. Runway 13-31, taxiways, aprons at Joint Air Reserve Training Center at Alvin Callender Field, NOY 96352, Spec. 43912, Belle Chasse, NEW ORLEANS, LA. Eighth Naval Dist., Bldg. 16, U. S. Naval Station, New Orleans, La. Bids Nov. 3. CD 10/18.

▲ **TENNESSEE**—State Hy. Dpt., Nashville,
Tenn.—**Mid-South Constr. Co.,** Adamsville, Tenn., LB, **$90,069.** grading, drainage, surf. 2 precast concrete deck and timber pile bridges Sec. Rte. 8082, S-8082 (4), Chester Co.;
Tenn.—**W. T. Ratliff Co.,** Rutledge Pike, Knoxville, Tenn., LB, **$163,625.** surf., bit. State Rt. 32 SP 1148-A, Cocke Co.;
Tenn.—**Malone Brothers,** Greenville, Tenn., LB **$173,986.** grading, drainage, surf. 2 bridges 7.582 mi. Sec. Rt. 2390, S-2390 (1), Greene Co.;
Tenn.—**Lehman-Roberts Co.,** 1098 Wilson St., Memphis, Tenn., LB, **$242,550.** bit. material repairing, 26.512 mi. State Rt. 1, SP-1149-A, Haywood, Tipton, Fayette and Shelby Counties;
Tenn.—**W. E. Graham & Sons,** Cleveland, N. C., LB, **$1,238,280,** grading, drainage, surf. 11 concrete box type bridges, State Rt. 34, 6.788 mi. F-034-4 (3), Johnson Co.;
Tenn.—**Knoxville Constr. Co.,** Neyland Dr., Knoxville, Tenn., LB, **$181,686,** grading, drainage, surf. Sec. Rte. 2503, 4.155 mi. S-2503 (1), Knox Co.;
Tenn.—**Interstate Constr. Co.,** 3rd Natl. Bank Bldg. Nashville, Tenn., LB, **$172,072,** grading, drainage, surf., 3 bridges 4.125 mi. Sec. Rte. 6203, S-6203 (2), Lawrence Co.;
Tenn.—**L & M Constr. Co.,** 843 Vance Ave., Memphis, Tenn., LB, **$428,313.** grading, drainage paving, widn., concrete girder bridge 1.987 mi. State Rte. 5, F-005-2 (3), Pt 1; widn., resurf. 0.744 mi. State Rte. 5, SP-1126-B, Madison Co.;
Tenn.—**W. P. McClanahan,** Centerville, Tenn., LB **$223,562,** grading, drainage, surf., 4 bridges 8.067 mi. Sec. Rte. 61801, S-6181 (1), Maury Co.;
Tenn.—**Harry Berry Co.,** Hopkinsville, Ky., LB, **$288,308** paving 10.324 mi. State Rt. 11, F-011-2 (17), Marshall Co.;
Tenn.—**Pat H. Eatherly,** Carthage, Tenn., LB, **$103,200.** grading, drainage, surf., 3 concrete box type bridges 3.588 mi. Sec. Rt. 4251, S-4251 (1), White Co.;
Tenn.—**A. B. Long,** Harriman, Tenn., LB, **$414,781.** grading, drainage, surf., 6.519 mi. State Rt. 1, Proj. F-001-6 (11), Pt. 1, White and Cumberland Counties;
Tenn.—**Warren Brothers,** 1900 Hayes St., Nashville, Tenn., LB, **$194,456,** widn., resurf. 7.452 mi. State Rte. 2, F-002-1-(4), Rutherford Co.;
Tenn.—**John L. Brinkley Co.,** Shelbyville, Tenn., LB, Rte. 28, F-028-1 (11), Pt. 1, Bledsoe Co.;
$393,082, grading, drainage, surf. 5.56 mi. State
Tenn.—**T. E. Gillespie,** Lebanon, Tenn., LB, **$308,602.** grading, drainage, surf. 5.564 mi. State Rt. 28, F-028-1 (10) Pt. 1, Bledsoe Co. Bids Nov. 4. CD 10/17.

BUILDINGS—LB & CA

▲ **Midland Constr. Co.,** Box 1227, Little Rock, Ark. CA **$1,405,000.** masonry Kohn Junior High SCHOOL, 1800 and 1900 blocks of Bartholomew St., NEW ORLEANS, LA. Orleans Parish School Bd., 703 Carondelet St., New Orleans, La. Bids Oct. 27, awarded Nov. 3. CD 11/7, under LB.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
November 22, Michigan, Ohio November 29 Wisconsin
After December 13 Ohio
STREETS AND ROADS
November 22 Ohio November 29 Wisconsin

▲ **Wis., Green Bay**—BA 11/29—City, City Hall, water filtration plant. $1,500,000. Extended date. Alvord, Burdick & Howson, 20 N. Wacker Dr., Chicago, Ill., engrs. CD 10/25.

BUILDINGS—BA

▲ **O., Cincinnati**—SHOPPING CENTER—BA After 1/1—Walters Bros., 7911 Reading Rd., (selected list bidders), shopping center, Winton Rd. and Hempstead Dr. $2,000,000. Cordes, Pressler, Houck & Assoc., 4939 Paddock St., Cincinnati, archts. Beineke & Ruehlmann, 626 Broadway, engrs. CD 9/23.

BUILDINGS—SLC

▲ **Ill., Aurora**—Y.M.C.A. BLDG.—Aurora Young Men's Christian Assn., c/o Bertram A. Weber, archt., 221 N. La Salle St., Chicago, soon lets contract Y.M.C.A. bldg. $1,370,000.

BUILDINGS—LB & CA

▲ **Herbert Kroeger,** c/o Herman Bloom, 3241 Harrison St., Cincinnati, O. Owner Builds. **$1,250,000.** 70 one story bsmnt., brick HOMES off Jessup Rd. in extension of Giffindale Subdivision, CINCINNATI, O. Charles Bonfield, 4953 Shirley Pl., Cincinnati, O., engr. Awarded Nov. 4.

▲ **H. L. Vokes Co.,** 1000 Wayside Ave., Cleveland 19, O. CA Est. **$1,500,000.** design and construct 6 story OFFICE, CLEVELAND, O. University-Cedar Medical Center, Inc., 2828 Euclid Ave., Cleveland 15, O. CD 1/27.

▲ **Fred W. Orr Co.,** Union Commerce Bldg., Cleveland 14, O. Own Forces. **$2,400,000.** 180 HOMES and eight 11-suite efficiency APARTMENTS, on 54 acre site, SHELBY, O. Chester N. Lowe, 16828 Kinsman Rd., Cleveland 20, O., archt. CD 10/5.

▲ **George A. Fuller Constr. Co.,** 111 W. Washington St., Chicago, Ill., CA. Est. **$17,500,000.** 6 story, 627,700 sq. ft. Co-operative OFFICE BLDG., S. Wacker Dr. between Adams and Monroe Sts., CHICAGO, ILL. Adams-Monroe Wacker Corp., c/o Arthur Rubloff & Co., agt., 100 W. Monroe St., Chicago, Ill. Skidmore, Owings & Merrill, 100 W. Monroe St., Chicago, Ill., archts.-engrs. CD 11/7.

▲ **R. B. Evans Constr. Co.,** 441 N. Walnut St., Springfield, Ill., CA **$1,343,700,** general contract two JUNIOR HIGH SCHOOLS, SPRINGFIELD, ILL. School District No. 5, Springfield, Ill. Bids Nov. 2, awarded Nov. 7. CD 11/7, under LB.

▲ **Scanlon Real Estate Co.,** 4205 Warren St., Detroit, Mich. Owner Builds. **$1,250,000.** 115 brick HOMES Palmer Rd., Venoy St. section, NANKIN, MICH.

▲ **Edward Rose & Sons,** 14900 Linwood St., Detroit, Mich. Owner Builds. **$4,100,000.** Masonic Development, 250 brick HOMES, Thorncrest and Masonic Sts., ST. CLAIR SHORES, MICH.

▲ **Gerald L. Vineyard Building Co.,** Utica, Mich. Owner Builds. **$3,000,000.** Timberline Meadows HOUSES, Timberline Dr. north of 23 Mi. Rd., SHELBY, MICH.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

▲† **Kan., Topeka**—HOSPITAL—BA On Or About 12/29—U. S. Eng., 1800 Federal Office Bldg., Kansas City 6, Mo., hospital, Forbes Air Force Base, ENG-23-028-56-36. $3,000,000. CD 9/12.

▲† **Tex., Ellington Air Force Base**—HOSPITAL—BA 12/29—U. S. Eng., P. O. Box 1229, Galveston, 1 story, 67,720 sq. ft. 75-bed masonry hospital, ENG-41-243-56-8. $1,000,000-$3,000,000. CD 2/15.

BUILDINGS—BA

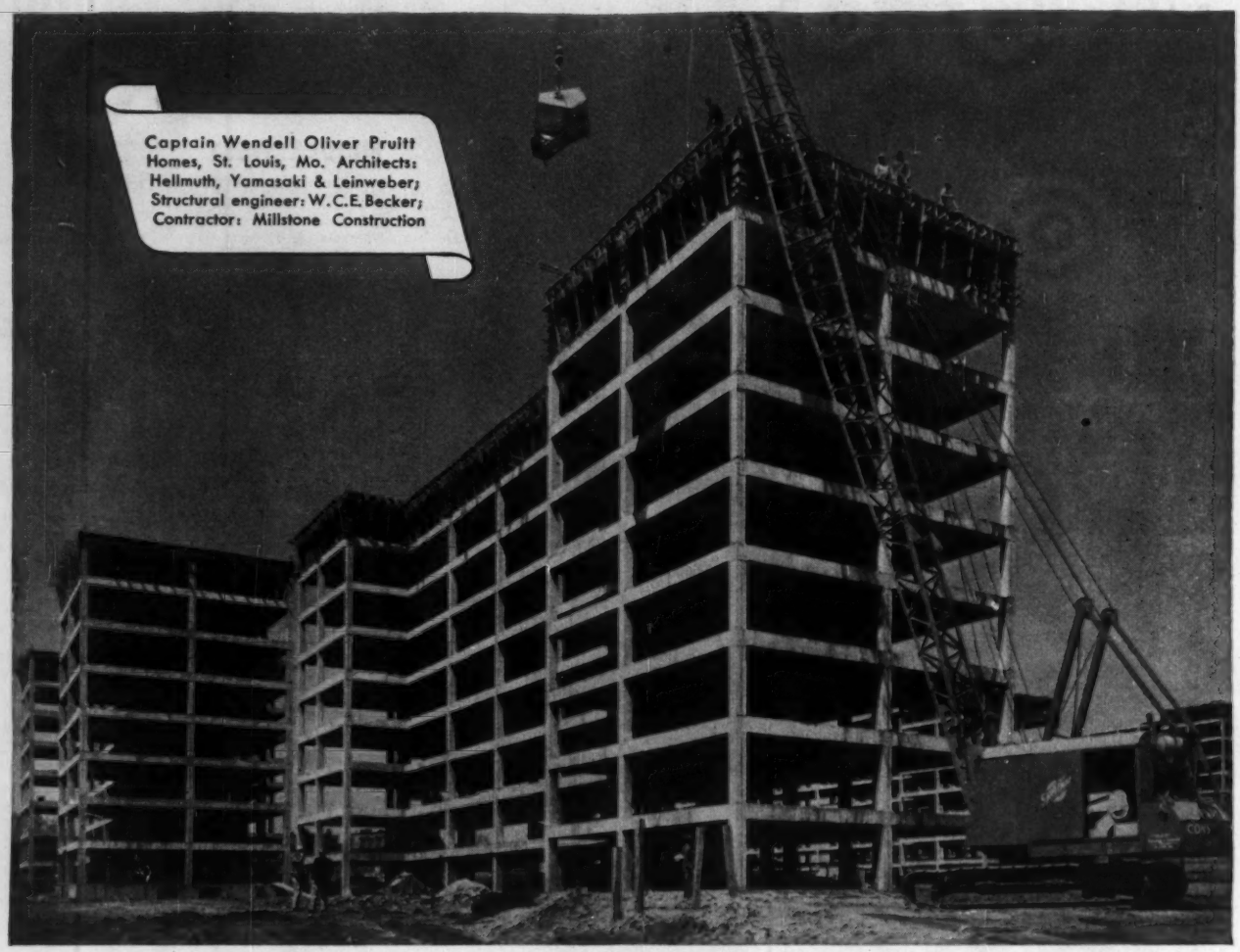
▲ **Neb., Omaha**—OFFICE—BA 11/29—Northwestern Bell Telephone Co., 19 and Douglas Sts., 12 story office, 19th and Dodge St. near present Bldg. $3,500,000. L. A. Daly Co., Insurance Bldg., archt. CD 12/8/54.

HEAVY CONSTRUCTION—LB & CA

▲† **Weitz Co. & J. D. Armstrong Co., Inc.,** 406 Fleming Bldg., Des Moines, Iowa, CA **$2,215,203** Stage III, earthfill dam, concrete spillway Coralville Reservoir, Iowa River, Inv. 11-117-56-7, IOWA. U. S. Eng., Clock Tower Bldg., Rock Island, Ill. Bids Oct. 18. CD 10/21, under LB.

▲ **L. G. Barcus & Sons,** 1430 State St., Kansas City, Kan. LB **$2,097,505.** (4 bidders). north approach to Broadway Bridge and Airport Plaza area, will pass in front of Municipal Terminal, Contr. No. 5, KANSAS CITY, MO. City, City Hall, Kansas City, Mo. Bids Oct. 18.

(Continued on page 91)


Captain Wendell Oliver Pruitt
Homes, St. Louis, Mo. Architects:
Hellmuth, Yamasaki & Leinweber;
Structural engineer: W.C.E. Becker;
Contractor: Millstone Construction

Concrete Frames and Floors

...MONEY-SAVING CONSTRUCTION FOR MODERN APARTMENT BUILDINGS

The St. Louis Housing Authority chose reinforced concrete frames and floors for its Captain Wendell Oliver Pruitt Homes. On 34½ acres, the project includes 20 eleven-story buildings, two million sq. ft. of floor area.

Critically-needed housing projects like the Pruitt Homes can be built faster and with greater economy when designed for concrete frames and floors. Those are two reasons why more and more modern apartment buildings are being built with this type of framing.

Reinforced concrete frame and floor construction offers architects, engineers, contractors and owners many advantages. For example, frame and floor construction proceed simultaneously. Walls can be finished as the building goes up. Facilities for heating and ventilating, as well as plumbing and wiring can be installed as the structural work progresses. This saves time and money.

Competitive bids and cost analyses show that savings up to 40% on frame and floor costs are possible with concrete. Concrete is sturdy and firesafe, gives years of service with little upkeep. This ***low annual cost*** is a bonus for owners, investors and tenants.

For help in designing reinforced concrete frames and floors for structures of any size or for any purpose—for apartments, schools, hospitals or commercial buildings—write for free illustrated literature. Distribution is limited to the United States and Canada.

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(Continued from page 89)

▲ **Parsons Constr. Co.**, 2512 Deer Park Blvd., Omaha, Neb., CA $1,063,295. demolish buildings, road work, drain piping, pumps, meters, controls, feed lines, piping outside all for water basins, OMAHA, Neb. Metropolitan Utilities Dist., 18 and Harney Sts., Omaha, Neb. Bids Oct. 10. CD 10/17, under LB.

▲ **Kansas City Bridge Co.**, 928 Broadway, Kansas City, Mo., LB $1,598,380, est. $2,000,000. Phase No. 2, Pelican Island Bridge Proj. to connect Galveston Island with Pelican Island, draw bridge spans, GALVESTON, TEX. City, H. Y. Cartwright, Jr., mayor, City Hall, Galveston, Tex. Bids Nov. 4. CD 10/13.

BUILDINGS—LB & CA

▲ **Frazier-Davis Constr. Co.**, 1319 Macklin Ave., St. Louis 10, Mo. CA Est. $1,000,000. 1 story, brick, steel, concrete, masonry 50,000 sq. ft. SERVICE BLDG. for service, constr. and maintenance depts., storage and garage, 6400 Graham Rd., BERKELEY (ST. LOUIS 21 P.O.), MO. Laclede Gas Co., 1017 Olive St., St. Louis 1, Mo. Russell, Mulgardt, Schwarz, Van Hoefen, 1620 Chemical Bldg., 721 Olive St., St. Louis 1, Mo., archts. CD 8/22, under Missouri, Unclassified. CD 11/17/55.

▲ **C. T. Wilson Contg. Co.**, 10401 Trongate Place, Glasgow Village 15, Mo. CA Est. $5,250,000. 600 RESIDENCES on 100-acre tract adjacent to Glasgow Village subdivision, GLASGOW VILLAGE (ST. LOUIS 15 P.O.), MO. Glasgow Village Development Corp., 10401 Trongate Place, Glasgow Village 15, Mo.

▲ **McCarthy Bros. Constr. Co.**, 4903 Delmar St., St. Louis, Mo. CA Est. $4,000,000. HOTEL, Madison Dr. and Capitol Ave., JEFFERSON CITY, MO. J. Harvey Hyams, 101 S. Merrimac St., St. Louis, Mo. Paul Klingensmith, 4232 W. Pine St., St. Louis, Mo., archt.

▲ **Robert E. McKee, General Contractor, Inc.**, Box 562, El Paso, Tex., CA $1,711,000, est. $1,500,000, new central Y.M.C.A. BLDG., EL PASO, TEX. Young Men's Christian Assn., 530 N. Oregon St., El Paso, Tex. Bids Oct. 11. CD 10/24, under LB.

▲† **Phil S. Hardy Const. Co.**, 205 Texas City Hall, Texarkana, Tex., LB $1,181,797, Lot A; LB $1,219,702, Lot B; LB $1,425,322, Lot C; LB $1,463,227, Lot D, AMMUNITION RENOVATION FACILITIES, 2nd increment, Red River Arsenal, ENG-34-066-56-18, TEXARKANA, TEX. U. S. Eng., Box 61, Tulsa 2, Okla. Bids Nov. 2. CD 10/21.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
December 2, 7 California

▲† **California**—AAA SITES—BA 11/29—U. S. Eng., 751 S. Figueroa St., Los Angeles, tactical and administrative facilities, AAA Sites, LA-98-C and LA-98-1, Los Angeles Co., ENG-04-353-56-38. $1,000,000.

BUILDINGS—BA

▲ **Calif., Sacramento**—OFFICE—BA 12/6—State Div. Architecture, P. Wks. Bldg., structural steel, rein.-con. office for Dpt. Veterans Affairs, 13 and O Sts. $1,650,000. Plans deposit $100.

HEAVY CONSTRUCTION—LB & CA

▲ **Morrison-Knudsen Co.**, 319 Broadway, Boise, Idaho. CA $87,000,000. Oxbow and Brownlee Hydro-electric projects on Snake River, IDAHO. Idaho Power Co., 1220 Idaho St., Boise, Idaho. CD 8/8.

▲ **OREGON**—State Hy. Comn., Highway Bldg., Salem, Ore.—**Allum Bros.**, Eugene, Ore., CA $92,336, (11 bidders) surf., oiling 5.46 mi. Westside County Rd., FAP S-101 (4), Lake Co.;

Ore.—**Central Heating Co.**, 685 Olive St., Eugene, Ore., CA $383,502 (8 bidders) paving 6.83 mi. Shady-Booth Ranch units of Shady-Canyonville sect., Pacific Hy. FAP BFI-78 (24), Douglas Co.;

Ore.—**Central Paving Co.**, Independence, Ore., CA $144,386 (11 bidders) grading, paving 4.58 mi. Paulina Secondary Hy. FAP S-154 (2), Crook Co.;

Ore.—**Gibbons & Reed**, 825 W. 9 N. St., Salt Lake City, Utah, CA $1,097,068, (10 bidders) grading, concrete structure 1.91 mi. Union Ave.-37th Ave., Sect. of Banfield Freeway, M FAP UI-323 (15), Multnomah Co.;

Ore.—**Houck & Son.**, 1585 N. 20 St., Salem, Ore., CA $386,230 (14 bidders) grading, paving 6.13 mi. Sherman Hy. FAP F-152 (4), Sherman Co.; CA $238,301 (14 bidders) grading, oiling 2.42 mi. Three Mile Lane Hy. FAP S-96 (3), Yamhill Co. Grand total $2,341,823. Bids Nov. 3. R. H. Baldock, c/o owner, engr.

BUILDINGS—LB & CA

▲ **Bennett-Campbell, Inc.**, 6401 Carleton St., Seattle, Wash., CA $1,000,000. 3 story, 80-unit MOTOR HOTEL, MOSES LAKE, WASH. Moses Lake Lodge, Inc. Moses Lake, Wash. Harman, Pray & Detrich, Lloyd Bldg., Seattle 1, Wash. archts.

▲ **Multnomah School Dist. 7**, 5 and Main Sts., Fairview, Ore., rejected bids Oct. 18, seven-building HIGH SCHOOL, FAIRVIEW, ORE. LB $2,135,597. CD 10/21, under LB.

▲ **Howard S. Wright & Co.**, 414 Pontius St., Seattle, Wash., CA Total est. $12,000,000. paper mfg. and converting PLANT, ANTIOCH, CALIF. Crown Zellerbach Corp., 343 Sansome St., San Francisco, Calif. CD 11/7, under LB.

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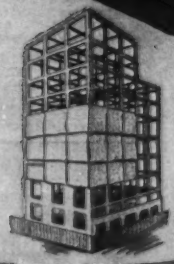
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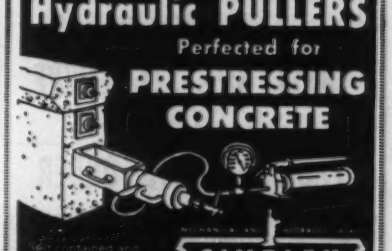
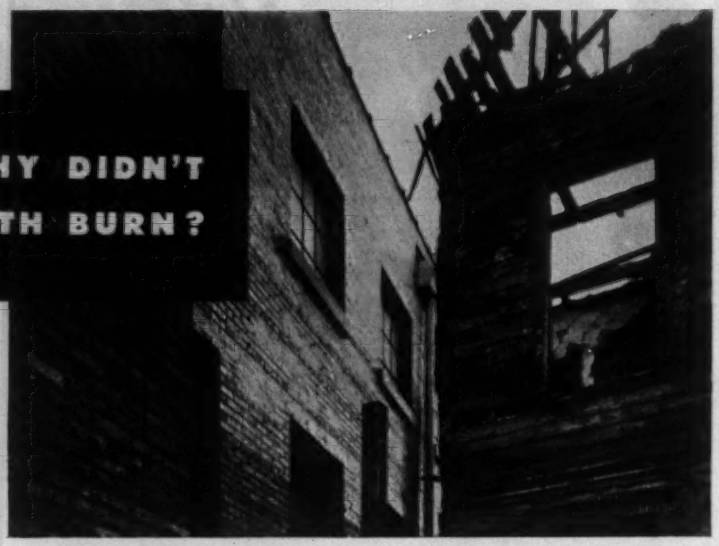


TEMPLETON, KENLY & CO. Broadview Illinois
2553 Gardner Road



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When fire utterly gutted this building, it was unable to spread to the neighboring structure because Mississippi Wire glass windows, in metal frames, efficiently prevented windblown sparks and searing heat from reaching the interior. For though cracked by heat or smashed by a blow, wire glass tends to remain in the opening . . . continues to offer utmost protection at minimum cost.

And these same properties enable Mississippi Wire Glass (Approved Fire Retardant No. 32) to help bottle up fires and prevent them from roaring into a costly tragedy like that above.

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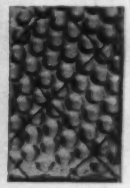
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▲ **Headliner Homes**, 3139 N. 7 St., Fresno, Calif., Owner Builds, $2,613,125. 185 HOME SUBDIVISION, FRESNO, CALIF.

▲ **Del Preston**, 322 Miller Ave., Mill Valley, Calif. Owner Builds, $1,479,000. 87 HOME SUBDIVISION on 30-acre site, Rainbow Knolls, near MILL VALLEY, CALIF.

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

STREETS AND ROADS

November 23 Ontario

Ontario—BA 11/29—St. Lawrence Seaway Auth., No. 2 Temporary Bldg., Ottawa, Ont., widen Welland Ship Canal between Locks 1 and 2, Plans deposit $100; widen Welland Ship Canal between Locks 2 and 3, Plans deposit $100; widen Welland Ship Canal between Locks 3 and 4, Plans deposit $100, for St. Lawrence Seaway Proj., St. Catherines, Ont. A. Gordon Murphy, 685 Cathcart St., Montreal, Que., engr. CD 9/9/54.

BUILDINGS—BA

▲ **Ont., Trenton**—MILL—BA 11/21—Hinde & Dauche Paper Co. of Canada Ltd., 43 Hanna Ave., Toronto, steel, brick hardwood pulp mill. $2,000,000. G. E. Boyde, c/o owner, ch. engr. CD 4/27/51.

▲ **Ont., Niagara Falls**—HOSPITAL—BA 12/1—Greater Niagara Hospital Trust, F. M. Cairns, chn. 264-bed hospital, $2,500,000. Extended date. J. B. Parking Assocs., 1500 Don Mills Rd., Toronto, archts. CD 10/24.

HEAVY CONSTRUCTION—LB & CA

▲ **Kenney Constr. Co. Ltd.**, Drawer 380, Yarmouth, N. S., LB, $3,177,450. (11 bidders) air terminal bldg., at airport, GANDER, NEWFOUNDLAND, Dpt. Transport, Hunter Bldg., Ottawa, Ont. Bids Oct. 25. CD 10/3.

▲ **McNamara Constr. Co. Ltd.**, 42 Industrial St., Toronto, Ont., LB, $2,563,065 (19 bidders) 2 runways with connecting taxiways and aircraft parking areas, Halifax Airport, HALIFAX, N. S. Dpt. Transport, Hunter Bldg., Ottawa, Ont. Bids Nov. 4. CD 10/31.

▲ **ONTARIO**—Dpt. Hys., Parliament Bldgs., Toronto, **Hamilton Bridge Div., Bridge & Tank Co. of Canada Ltd.**, CA, $1,598,700 (2 bidders) Contract 55-202, structural steel for superstructure, Part F, Burlington-High-Level Bridge, Burlington. Bids Oct. 26, awarded Nov. 1. CD 11/2, under LB.

BUILDINGS—LB & CA

▲ **Maclab Constr. Co., Ltd.**, Edmonton, Alta., Owner Builds, $25,000,000, 2,000 dwellings, RESIDENTIAL DEVELOPMENT and SHOPPING CENTER, east of city limits near Hy. 16, EDMONTON, ALTA. CD 11/9.

▲ **Kenney Constr. Co., Ltd.**, Drawer 380, Yarmouth, N. S., CA, $1,155,000 (9 bidders)—FEDERAL PUBLIC BLDG., SYDNEY, N. S. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont. Bids Nov. 2. CD 9/29.

▲ **Foundation Co. of Canada, Ltd.**, 166 Douglas St. W., Sudbury, Ont., CA $1,336,086. HIGH SCHOOL, SUDBURY, ONT. Nickel District Collegiate Institute Bd., 12 Stewart Dr., Sudbury, Ont. Bids Aug. 24, awarded Oct. 31. CD 10/7, under LB.

▲ **Anglin-Norcross, Quebec, Ltd.**, 892 Sherbrooke St. W., Montreal, Que., CA, Est. over $40,000,000. HOUSING PROGRAM, incl. 2,000 houses, CHATEAUGUAY, QUE. Owner, c/o H. Joseph & Co., Inc., 4492 St. Catherine St. W., Montreal, Que. Alan Crossley, 1609 Dorion St., Ottawa, Ont., town planning consultant. CD 8/24.

▲ **Georges A. Demontigny**, 2540 Carmel Blvd. Three Rivers, Que., CA, $6,000,000. 600-unit HOUSING PROGRAM, LA TUQUE, QUE. Les Enterprises de la Tuque, Edefice Marchand, corner of Commercial and Tessier Sts., La Tuque, Que.

▲ **Foundation Co. of Canada, Ltd.**, 1900 Sherbrooke St., W., Montreal, Que., CA Est. $3,000,000. new structure for plate SHOP, approx. 160x400 ft., with crane runways, etc. reconstr., LAUZON, QUE. Davie Shipbuilding Ltd., 22 Davie St., Lauzon, Que. Wood & Blachford, 4444 Sherbrooke St. W., Montreal, Que., archts. Wood, McAdam & Magor, 4444 Sherbrooke St. W., Montreal, Que. engrs. Awarded Nov. 1. CD 11/4.

▲ **D'Amours & Frere Ltd.**, 2633 Bourbonniere Ave., Montreal, Que., CA, $1,200,000, 4 story, 100x400 ft. STORES and GARAGE, Sherbrooke St. E., MONTREAL, QUE. Montreal Catholic School Comn., 117 St. Catherine St. W., Montreal, Que. Lalonde & Valois, Canada Cement Bldg., Montreal, Que., engrs. Awarded Oct. 31.

▲ **Maglorie Caughon Ltd.**, 311 de La Salle St., Quebec City, Que., CA, $5,000,000 (11 bidders) 1 story, bsmnt., CHAPEL and 3, 4 and 5 story, GRAND SEMINARY, both rein.-con. granite walls, QUEBEC CITY, QUE. Laval University, Quebec City, Que. Awarded Oct. 27. CD 10/20.

LATIN AMERICA

HEAVY CONSTRUCTION—LB & CA

▲ **Smith Engineering & Constr. Co.**, P. O. Drawer 1831, Pensacola, Fla., CA $2,000,000, airport terminal bldgs. at Quito and Guayaquil, ECUADOR. Govt. of Ecuador, Quito, Ecuador. Airways Engineering Corp., 1212 18th St. N. W., Wash. 6, D. C., U. S. A., engrs. Design and supervision of constr. (Correction—engineers' status.) CD 10/26 under CA.

(Proposal Advertisements see pp. 108 to 110)

Station #304 of the Texas Illinois Natural Gas Pipe Line Co., Marshall, Texas

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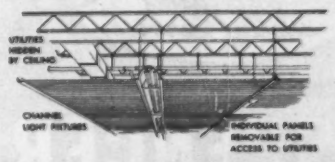
The installation shown is so successful, the Texas Illinois Natural Gas Pipe Line Co. is using ReynoCoustic in seven more stations. Consider this superior treatment wherever you have a noise problem.

A complete installation service is available. For name of nearest franchised acoustical applicator, call the Reynolds office listed under "Building Materials" in classified phone books of principal cities. For complete literature write to Reynolds Metals Company, Building Products Division, 2009 South Ninth Street, Louisville 1, Kentucky.



In the pipe line station, ReynoCoustic panels were laid on roof girders. Above is a more typical installation — panels laid horizontally on T channels, forming a suspended ceiling with ready access to utilities above. Noise reduction up to .90, uniformly high at all frequencies.

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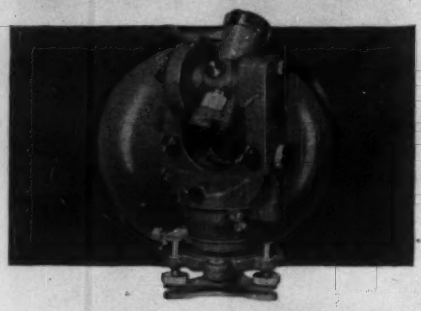

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UNIT PRICES

2-Way Turnpike Bids, Conn.

Contract for the Greenwich-Killingly Expressway, 15,440 ft long, 2-36 ft wide, nine and ten in. deep, is still pending court's decision on legal action taken by Defelice & Son, Inc., low bidder for the blacktop alternate, against Newman E. Argraves, Connecticut State Highway Commissioner. The bondholders want portland cement concrete (ENR Oct. 13, p. 23). For contract award watch News and Construction Reports pages.

The 13 bidders included:

Road Grading and Drainage

1 L. G. Defelice & Son, North Haven	$2,603,562
2 Savin Const. Corp, East Hartford	$2,621,883

Bids: 9-26-55 Items	Unit	Quantity	Unit Prices 1	2
Maint & prot traffic	ls	job	$30,000	$25,000
Clear & grub	ls	job	50,000	25,000
Excav, earth	cy	508,673	0.55	0.50
rock	cy	78,520	2.50	2.00
loam	cy	19,100	0.45	0.40
struct, compl	cy	11,225	5.00	3.00
Remov exist masy	cy	27	10.00	20.00
Matl surcharge rehand	cy	57,400	0.40	0.35
Excav trench, to 6' deep	cy	9,083	2.00	1.50
to 10'	cy	3,482	3.00	2.00
to 15'	cy	4,222	4.00	3.00
to over 15'	cy	990	6.00	4.00
rock in trench, to 6'	cy	2,313	7.00	5.00
to 10'	cy	45	12.00	5.00
to 15'	cy	70	15.00	8.00
ditch	cy	1,935	1.50	1.00
Platforms, settlement	ea	14	50.00	100.00
Pipe, RC, 15"	lf	9,458	3.00	3.00
18"	lf	2,212	4.00	3.50
24"	lf	840	5.00	5.00
36"	lf	216	11.00	11.00
42"	lf	388	15.00	14.00
48"	lf	1,864	16.00	16.00
72"	lf	292	42.00	40.00
ACCM, 15"	lf	1,784	4.00	4.00
18"	lf	140	5.00	5.00
24"	lf	284	6.00	7.00
48", 10 gauge	lf	184	21.00	20.00
8 gauge	lf	452	25.00	24.00
60", 8 gauge	lf	340	30.00	34.00
perf, 6"	lf	2,147	1.50	2.00
RC, 42", relaid	lf	92	10.00	5.00
U'drain ACCMP, perf, 15"	lf	1,882	5.00	4.50
Foundation, ACCMP, perf, 6"	lf	4,948	2.00	2.00
8"	lf	2,028	3.00	3.00
outlet ACCM pipe, 6"	lf	876	1.30	2.00
8"	lf	102	2.00	3.00
Catch basin, type C	ea	78	250.00	250.00
C-L	ea	35	200.00	250.00
type C, over 10' deep	ea	1	450.00	350.00
Drop inlet, type C	ea	48	250.00	200.00
C-L	ea	14	250.00	200.00
E-1	ea	4	600.00	350.00
E-2	ea	1	700.00	400.00
Manhole	ea	7	200.00	400.00
over 10' deep	ea	1	400.00	500.00
type E-1	ea	1	900.00	500.00
E-2	ea	1	1,500	500.00
E-3	ea	1	1,200	500.00
E-4	ea	1	1,200	500.00
Cap exist C B	ea	3	50.00	100.00
Test pile, stl, 12BP53, 15'	ea	1	300.00	500.00
20'	ea	1	300.00	500.00
30'	ea	3	300.00	600.00
40'	ea	1	300.00	600.00
65'	ea	2	400.00	600.00
80'	ea	4	500.00	1,000
Piles, stl, furnish	lb	1,181,155	0.07	0.073
drive	lf	22,285	1.00	1.25
splice	ea	96	40.00	30.00
Conc, cl A	cy	14,013	45.00	50.00
Joint filler, bridge, premould, ¼"	sf	331	1.00	0.50
½"	sf	3,269	1.00	0.60
Struct stl	lb	4,755,172	0.138	0.16
Spiral shear connector bars	lb	50,607	0.50	0.80
Struct stl for trans line towers	lb	55,134	0.35	0.25
Metal flashing	lb	220	2.00	1.50
Dampproffing	sy	4,884	1.00	0.80
Metal bridge rail	lf	2,135	8.00	10.00
Gravel fill	cy	137	2.00	2.50
Pervious struct bkfl	cy	25,415	1.00	1.00
Bank grvl surf, rolled	cy	857	2.00	1.50
Surf treat, bit matl	gal	4,291	0.15	0.20
bit, sand cover	sy	5,148	0.15	0.10
Dust control, calcium chloride	ton	80	75.00	60.00
water	hr	1,200	6.00	5.00
Slopes, shape & clean	lf	30,200	1.00	1.00
Stone curb, granite, 8"	lf	4,182	4.00	4.00
curved	lf	564	5.00	5.00
Sidewalk, conc	sf	13,414	1.00	0.50
Ditch, paved	sy	839	4.00	4.00
Guide rail, 2-cable	lf	700	1.00	1.20
Anchorage, type C	ea	6	25.00	30.00
Post, single	ea	6	6.00	5.00
Paving, slope	sy	225	5.00	5.00
Barricade, tempy	lf	186	10.00	10.00
permt	lf	133	10.00	12.00
Pipe cond, telephone	lf	1,844	3.00	2.00
ilium, struct	lf	2,845	6.00	2.00
exway	lf	634	8.00	2.00
Signs, const, series 1	ea	35	50.00	42.00
2	ea	10	80.00	70.00
6A	ea	17	45.00	38.00
6B	ea	8	70.00	60.00
Trafficmen	hr	1,000	3.00	2.50
Bridge rail, met, 5'-0"	lf	272	15.00	12.00
Fabric, woven wire	sy	145	0.50	2.00
Cr stone, slope prot	ton	884	8.00	4.00
Pipe elbows, ACCM, 15"	lf	184	10.00	8.00
Endwall, grate & chain	ea	4	50.00	20.00
Boundary monuments, set	ea	200	15.00	15.00
plates, set	ea	5	15.00	10.00
Loam, f & p, 4"	sy	500	0.60	0.50
8"	sy	500	0.90	0.55
p, 4"	sy	70,000	0.25	0.15
8"	sy	33,900	0.30	0.15
Fertil & seed, type I	sy	103,900	0.05	0.06
type II	sy	135,167	0.04	0.06
Lime	ton	22	12.00	50.00
Mulch	sy	148,884	0.04	0.05
Fertil, seed & mulch on hydr sand fill	sy	28,332	0.09	0.15

*f—furnish *p—place

Reinforced Concrete Pavement, Alternate A

1 Savin Const. Corp, East Hartford	$2,384,529
2 John Arborio, Inc, Poughkeepsie	$2,476,830

Bids: 9-26-55 Items	Unit	Quantity	Unit Prices 1	2
Borrow	cy	942,196	$1.00	$1.00
hydr sand fill	cy	240,000	0.80	0.80
Stl bars, deformed	lb	1,601,514	0.12	0.13
Subbase	cy	88,743	1.00	1.30
Form subgrade	sy	244,900	0.15	0.15
Cr stone for base	ton	5,032	2.60	3.50
Gravel base, rolled	cy	14,294	1.50	2.00
Joint, transv, expans	lf	3,200	1.75	2.00
contr	lf	32,500	1.60	1.70
Bit exp jt filler, premould, ¼"	lf	1,335	0.60	1.00
Reinf matl for conc pav 8" or 9"	sy	114,187	0.60	0.50
10"	sy	39,109	0.70	0.60
Jt support, longitl	ea	15,600	0.50	0.55
Conc for pav	cy	40,096	16.25	16.00
Binder crse, bit conc	ton	6,170	8.25	9.00
Asph conc, hot	ton	6,740	8.25	9.00
Cr stone, bit mac pav	ton	511	4.00	4.00
Bit mac for pav	gal	9,664	0.16	0.14
Service bridge	ea	2	200.00	100.00
Park curb, conc	lf	6,025	2.00	2.00
doweled	lf	17,854	0.50	0.55
Lip curb, bit conc	lf	2,050	0.50	0.40

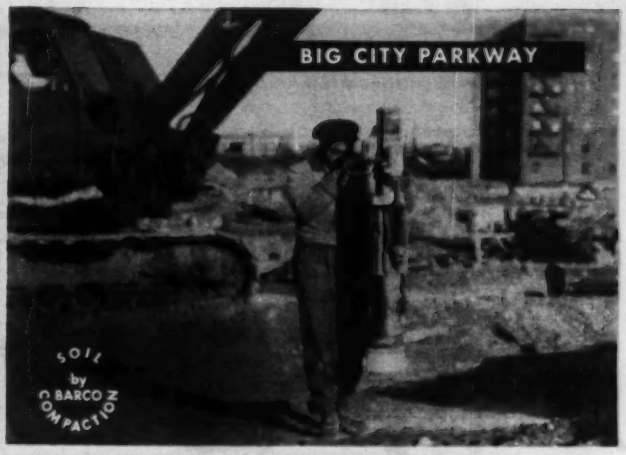
Bituminous Concrete Pavement, Alternate B

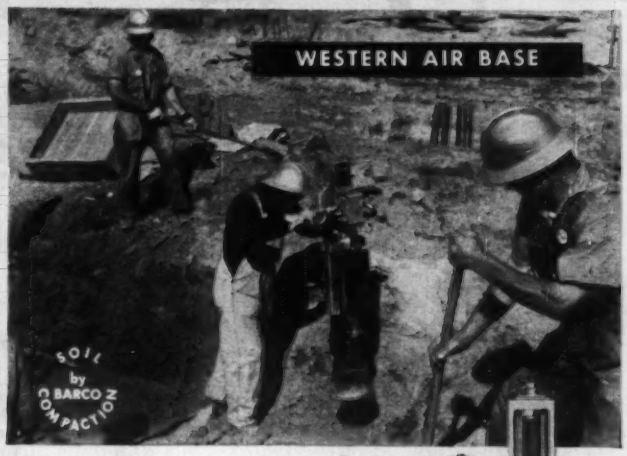
1 L. G. Defelice & Son, North Haven	$2,124,966
2 Savin Const. Corp, East Hartford	$2,161,711

Bids: 9-26-55 Items	Unit	Quantity	Unit Prices 1	2
Borrow	cy	918,000	$1.00	$1.00
hydr sand fill	cy	234,000	0.85	0.60
Stl bars, deformed	lb	1,596,804	0.11	0.12
Subbase	cy	120,000	1.10	1.50
Form subgrade	sy	244,900	0.15	0.15
Cr stone for base	ton	47,000	3.00	3.00
Gravel base, rolled	cy	13,200	1.10	1.50
Cr stone, bit mac base	ton	29,500	3.30	3.10
Binder crse, bit conc	ton	19,800	8.00	9.00
Asph conc, hot	ton	15,800	8.00	8.50
Cr stone, bit mac pav	ton	9,600	3.50	3.50
Bit matl for pave	gal	426,500	0.15	0.14
Curb, park, conc	lf	7,450	1.75	2.00
lip, bit conc	lf	44,000	0.35	0.50

Total	Alternate A	Alternate B
Savin Const. Corp	$5,006,412	$4,783,594
L. G. Defelice & Son	$5,099,736	$4,728,528
13 Lizza & Sons, Inc., Oyster Bay, N. Y.	$6,394,377	
Rusciano & Sons, Pelham Manor, N. Y., and Del Balso Construction Corp, Bronx, N. Y.		$5,972,204

GASOLINE **BARCO** RAMMER





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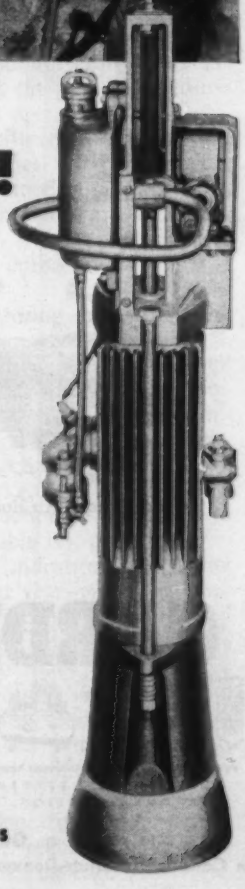

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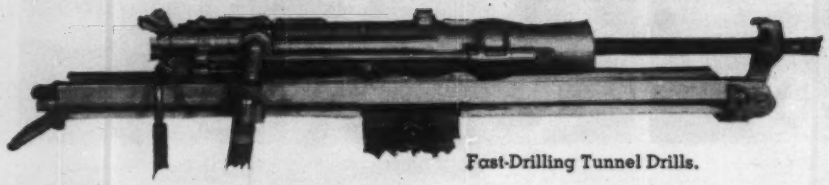

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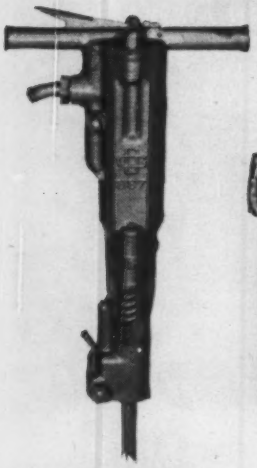

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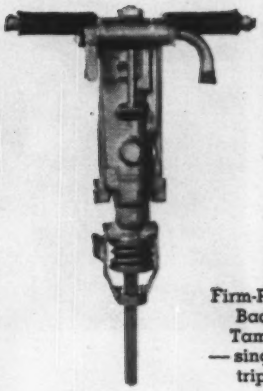

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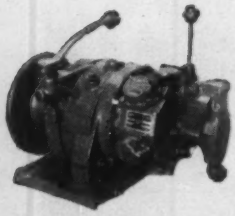

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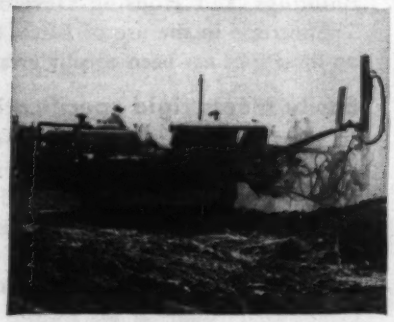
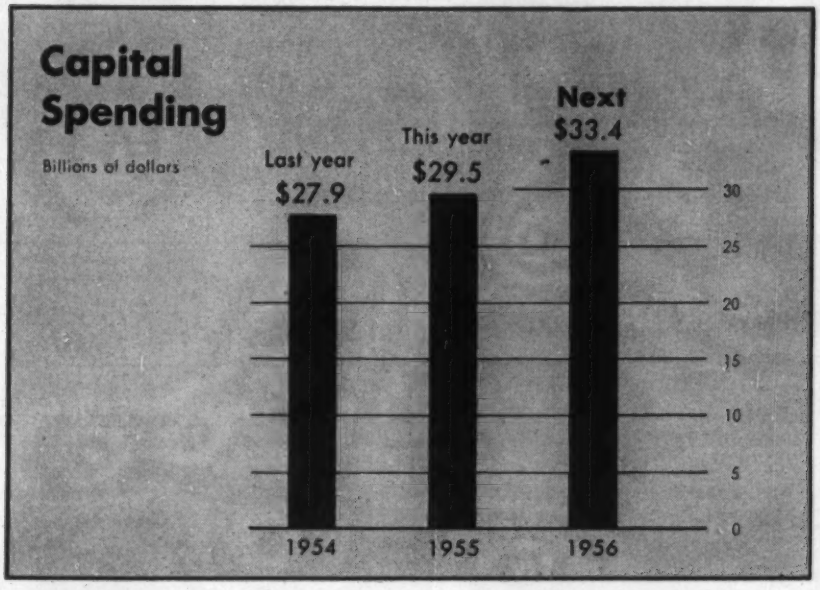
"Air Trac" and Wagon Drills with sectional rods for low-cost deep hole drilling. Note "Air Trac" towing its own portable compressor.



Tractor Jumbo — with Direct Connected compressor, rock drills and hydraulic boom jumbos.



THE LONGER LOOK:

U. S. businessmen plan to spend 13% more for new plants and equipment next year than in this record year of 1955

• American business now plans to spend 13% more for new plants and equipment in 1956 than in 1955. This is the largest increase in planned capital spending since 1951, when plans were boosted to meet the Korean war emergency. Present plans call for total business capital spending of $33.4 billion next year, compared with $29.5 billion estimated for this year and $29.2 billion in 1953, the previous peak (chart).

• Manufacturing companies plan to increase capital spending 30% next year—by far the biggest increase reported since just after Korea. Spending by commercial firms, railroads, and other transport and communications companies will also be up substantially, according to present intentions. The oil industry, as a whole, plans a 6% increase in 1956 spending. Programs of electric and gas utilities will be down slightly. And spending by mining companies will also be lower (See Table I, page 98).

• The new boom in capital spending may carry on into 1957. Many companies expect to equal or exceed their 1956 programs the following year.

These are the highlights of the preliminary survey of business plans for new plants and equipment made by McGraw-Hill's Department of Economics. They provide solid backing for ENR's forecast of a 15% gain next year for industrial contract awards and a 5% gain in commercial awards (ENR Oct. 20, p. 21). Most replies to the survey were received during the last three weeks of October, well after the first announcement of President Eisenhower's illness. Plans reported in this survey are preliminary, because many companies do not complete their budget reviews till later in the year. But in the past, these advance estimates have accurately shown the trend of capital spending. Plans for 1956 and 1957 will be reported in more detail in the regular annual McGraw-Hill survey of capital spending, to be made early next year.

• **Manufacturing** — In every line of manufacturing, companies are planning higher expenditures next year. The largest increases are in primary metals, in chemicals, and in the auto industry (See Table II, page 98).

Expansion is starting again in the same lines that added so much capacity during the Korean war boom. Back then, the steel and non-ferrous metals industries, in particular, added what was then thought to be a large amount of reserve capacity. And their spending for the past two years has been at reduced levels. But now these companies are planning new and large increases in spending—72% for steel, 54% for the non-ferrous group.

The chemical and petroleum refining industries, which also built considerable defense-supporting capacity in 1951-1953, then slackened in 1954-1955, now plan to boost spending sharply next year. Planned increases are 34% in chemicals and 13% for oil refineries. Paper and rubber companies are also scheduling much higher outlays. In all these lines, companies report that capacity is tight. And further large sales increases are expected in the near future.

• **Detroit dominates** — In metalworking, the picture is dominated by the tremendous program of the auto makers. The major companies plan substantial expansion of facilities next year, as well as new equipment to produce restyled cars for 1957 and automation. The planned increase of 68% will bring spending to $1.9 billion—the largest total for any single manufacturing industry. The previous record for this industry was $1.3 billion in 1954. These figures do not include special tools, dies, jigs, and fixtures. Spending in other major metalworking lines—machinery and electrical machinery—will be up. But plans are not yet equal to the peak expenditures of 1953.

The food and textile industries plan moderately higher capital spending next year. In food processing, this continues a long-term growth trend. But in textiles, it is an upturn after several years of cutbacks.

• **Non-manufacturing industries**—The oil industry expects to spend 6% more than in 1955 for new oil-well drilling and other production equipment, according to the replies received by the McGraw-Hill survey. The refining sector will spend 13% more, and marketing 7%. But new pipeline construction is scheduled to decline (See Table III, page 98).

The mining industries are cutting down 15% next year—mainly in non-ferrous mining. Coal and iron mining will be about the same. (These figures do not include new plans to treat taconite and other low-grade ores. Complete figures of this kind are still not available, but may average as high as $200 million per year in 1955 and 1956.)

Railroads plan to boost capital spending 27%, reflecting the high

(Continued on page 98)

level of rail traffic and improved earnings. Other transport and communications industries—airlines, shipping, trucking, telephones—also plan to raise spending. There's a 16% gain for this group as a whole.

Electric and gas utilities together are scheduled to spend 10% less—primarily due to a drop in projected gas pipelines. Electric utilities will spend less on generating equipment, more on transmission and distribution facilities.

An increasing number of commercial firms are participating in the annual McGraw-Hill surveys. This sample is limited to large chain stores, department and mail-order stores. So the figures must be interpreted cautiously. However, the reporting firms show an increase of 10% in capital spending next year, a strong indication of higher spending in the commercial sector.

• **What about 1957?**—The survey indicates that capital spending may stay at a very high level in 1957. Over half of all companies in the survey expect to spend as much in 1957 as in 1956. In manufacturing, and in every other major group except railroads, at least one company out of five already plans higher spending two years from now. So about ¾ of all firms participating in the survey plan to maintain or increase spending, beyond 1956.

The longer-run outlook for capital spending is particularly bright in these lines: chemicals, paper, rubber, airplines. In all of these fields, at least one-third of reporting firms already plan to increase spending in 1957. Nearly half of the chemical companies already have such plans. About 30% of the reporting firms in steel and petroleum expect to spend more in 1957 than in 1956.

The strength already apparent in plans for 1957 is especially striking in view of the large increase scheduled for 1956. If present 1956 plans are carried out, capital spending will not lose any of its present great momentum during the next year.

Plans for 1957, of course, are very tentative at this time. But in the past, companies have usually added to their advance plans, as the target date drew near. So present indications for 1957 are very favorable.

• **Sales prospects**—Companies in almost all industries are optimistic about sales next year. Manufacturers, on the average, expect gains of 7%. Commercial business is expected to

(Continued on page 100)

Table I—Industry's Plans for Capital Spending in 1956

Industry	1954 Actual	1955 Estimated	1956 Planned	% change 1955-1956
	Millions of dollars			
All manufacturing	$ 9,039	$ 9,299	$12,090	+30
Petroleum industry	4,850	5,026	5,320	+ 6
Mining	396	358	304	−15
Railroads	854	910	1,156	+27
Other transport & communications	2,954	3,143	3,647	+16
Electric & gas utilities	4,219	4,445	4,001*	−10
Commercial	6,379	6,971	7,668	+10
All business	**$27,891**	**$29,424**	**$33,361**	**+13**

Table II—Manufacturers' Capital Spending Plans

Industry	1954 Actual	1955 Estimated	1956 Planned	% change 1955-1956
	Millions of dollars			
Iron & steel	$676	$865	$1,488	+72
Non-ferrous metals	209	320	493	+54
Machinery	694	788	846	+ 7
Elec. machinery	439	449	507	+13
Autos	1,295	1,145	1,924	+68
Transportation equipment (including aircraft)	191	280	319	+14
Other metalworking	630	680	802	+18
Chemicals	1,130	1,032	1,383	+34
Paper	455	492	640	+30
Rubber	131	152	188	+24
Stone, clay & glass	361	461	493	+ 7
Petroleum refining	800	728	825	+13
Food & beverages	765	706	743	+ 5
Food	534	511	551	+ 8
Beverages	231	195	192	− 2
Textiles	331	331	363	+10
Miscellaneous manufacturing	932	870	1,076	+24
All manufacturing	**9,039**	**9,299**	**12,090**	**+30**

Table III—Other Industries' Capital Spending Plans

Industry	1954 Actual	1955 Estimated	1956 Planned	% change 1955-1956
	Millions of dollars			
Petroleum	**$4,850**	**$5,026**	**$5,320**	**+ 6**
Production	3,300	3,600	3,800	+ 6
Transportation	350	305	280	− 8
Refining	800	728	825	+13
Marketing	350	350	375	+ 7
Other	50	43	40	− 7
Mining	**396**	**358**	**304**	**−15**
Coal	184	171	169	− 1
Iron Ore	50	45	47	+ 4
Non-ferrous	122	92	45	−51
Non-metallic	40	50	43	−15
Railroads	**854**	**910**	**1,156**	**+27**
Other transport & communications	**2,954**	**3,143**	**3,647**	**+16**
Electric & gas utilities	**4,219**	**4,445**	**4,001***	**−10**
Commercial	**6,379**	**6,971**	**7,668**	**+10**

* Electrical World; American Gas Ass'n.

COULD FILL 48,000 RAILROAD CARS PER MONTH! Owned by a major coal company, this electric shovel weighs approximately 3,500,000 pounds and has a dipper capacity of about 50 cubic yards. Nevertheless, the mammoth machine is capable of climbing grades steeper than 20%! To help it achieve maximum performance in this grueling work, its owners, after testing nearly every major brand of gear lubricants, chose Cities Service L Compounds for the job. The results have justified this choice.

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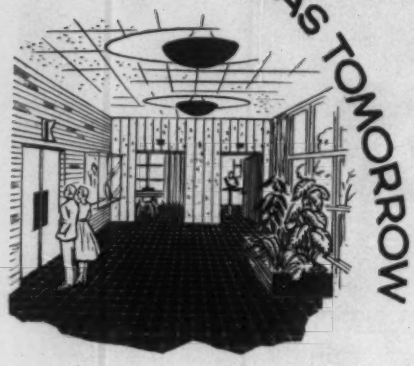

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be up 8%. In manufacturing—machinery, chemical, and textile firms expect the biggest increase. Each expects a 9% gain.

It's interesting to note that the two industries which are now planning the biggest increase in capital spending expect their 1956 sales to rise less than the average for all manufacturing. The steel and iron industry anticipates a sales gain of 5%, while the auto industry expects sales to climb 6%.

Since sales of these two industries will probably break records this year, any increase in sales will mean very large volume. But capital spending programs are obviously meant to anticipate sales beyond 1956. In the same way, the non-ferrous metals companies (refiners and fabricators) are also scheduling a large increase in capital spending, though they expect the smallest gain—2%—in sales for 1956.

However, most manufacturing lines look for at least average sales increases in 1956, on top of the very large gains made this year. The sales expectations which these companies have reported to McGraw-Hill could not be achieved without substantial additions to present manufacturing capacity.

One final note. The McGraw-Hill Survey was able to make estimates in changes in capital spending plans of certain industries, without giving any actual totals. For instance, the cement industry is expected to boost capital spending about 66% next year. That would be one of the biggest increases for any major industry. But capital spending by makers of construction and mining machinery is expected to decline 2%.

Banker Says FHA and VA Should Require ½-Acre Plots

The Veterans Administration and the Federal Housing Administration should aid slum control by requiring that no more than two homes per acre be allowed in tracts financed by GI and FHA mortgages.

That's the advice of Wallace Moir, president of the Mortgage Bankers Association, speaking at MBA's annual convention in Los Angeles earlier this month. Said Moir: "A cottage over 100 years old on a half-acre or more never becomes a slum. But when houses are packed together and you can hear your neighbor's plumbing, a potential slum has been built."

Other highlights of the meeting:

Thomas J. Sweeney of VA predicted that veterans will buy at least 400,000 new homes in 1956.

Albert M. Cole, head of the Housing & Home Finance Agency, said that tight mortgage credit has not yet hurt homebuilders. He added: "The hands that tighten the rein will not hesitate to loosen it when and as conditions so recommend."

Washington Court Throws Out State Building Authority Law

The highest court of one state has ruled that a state building authority is unconstitutional.

The Washington State Supreme Court has thrown out a law recently passed by the legislature which would have set up a state building authority. The authority would have financed state buildings by selling bonds, secured from rentals from the state.

Said the Supreme Court: "The law is not a leasing arrangement between landlord and tenant, but the installment purchase by the state of certain buildings and facilities with state money raised by taxation, far in excess of the constitutional limitation."

Business Briefs . . .

• **Two huge construction programs**—Standard Oil Co. (N. J.) plans to spend a record $1.2 billion on plant and equipment next year, up 20% from 1955. About 43% will be spent in the U.S., another 42% in other countries of the Western Hemisphere, and the rest in the Eastern Hemisphere. And Chrysler Corp. plans to spend over $1 billion in the next five years. The company will do research on nuclear energy, solar energy, and electronics as applied to vehicles.

• **Suburban shopping centers** are not overbuilt, according to Washington (D. C.) real estate economist Homer Hoyt. He told the American Institute of Real Estate Appraisers last week that : (1) About 22,000,000,000 sq ft of new department store space has been built or definitely planned in the suburbs since the end of World War II. (2) This space is just meeting the demand caused by 6,000,000 new suburban homes built since the start of 1950. Hoyt said his figures did not include Sears, Roebuck stores.

• **Thor Power Tool Co.**, of Aurora, Ill., has formed a new construction equipment division. First item of a projected complete line is a portable power troweling machine for finishing concrete.

LARGE SIZE AIRTHERM ROOF DECK REDUCES COST 10%

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No construction delay because of weather—that's the reason steel decking saves invaluable time and money. Airtherm large size Decking reduces labor and handling costs as much as 10% by actual installation reports. This results in additional time savings, quicker occupancy, fewer laps, greater structural strength, and a more fire and buckle resistant roof. Make us prove Airtherm's advantages on your next roof deck job. Phone, wire, or mail coupon.

Airtherm MANUFACTURING COMPANY
700 SOUTH SPRING
ST. LOUIS 10, MO.

MAIL COUPON

Airtherm Manufacturing Co. Dept. G.
700 S. Spring
St. Louis 10, Missouri

Gentlemen:

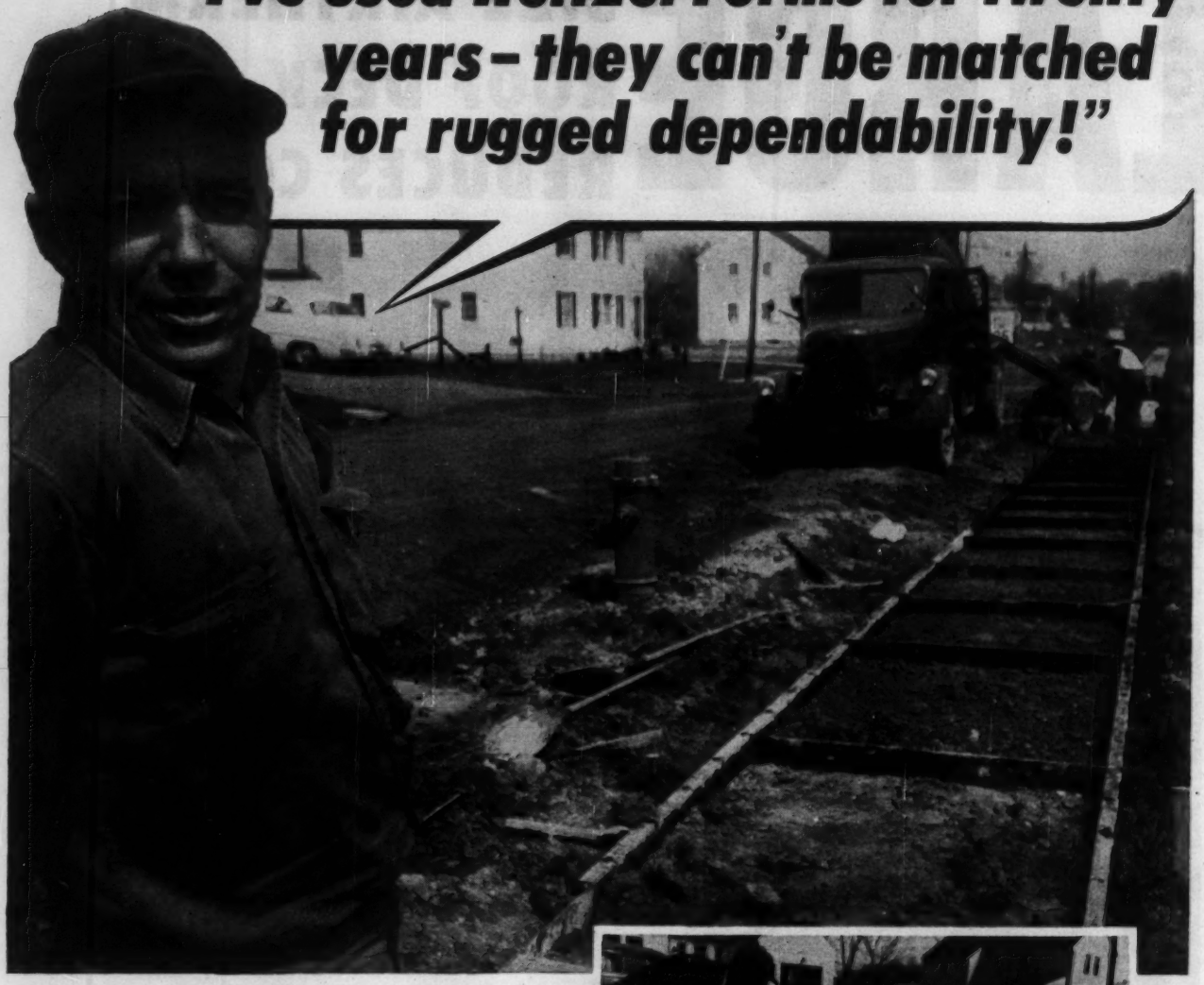
Please send complete information on Airtherm Roof Decking.

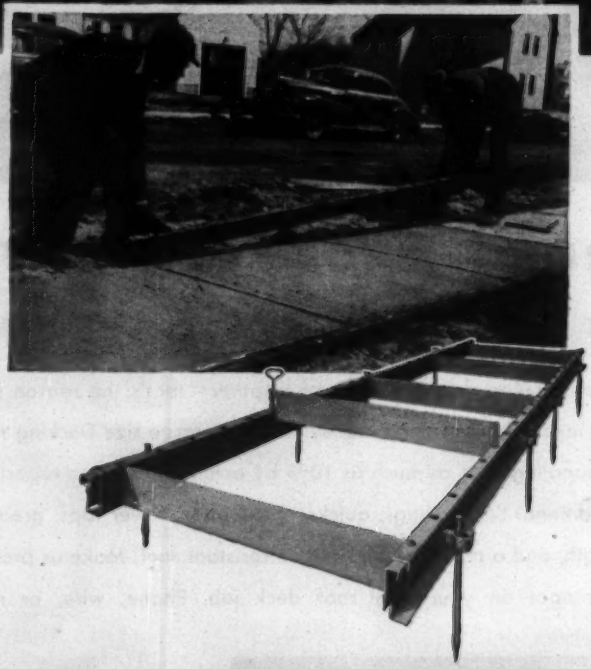
Name_____

Street_____

City_____ State_____

"I've used Heltzel Forms for twenty years – they can't be matched for rugged dependability!"





"Heltzel Steel Forms—both sidewalk and curb and gutter—are all they're reputed to be," states E. W. McShaffery, Ohio contractor. "They're quick setting, easy to align and they strip like they're supposed to. What's more they're built to last. I've used other makes, but none deliver the year-in, year-out service I get from Heltzel Forms."

There are hundreds of contractors like Mr. McShaffery who, through experience, know you can't beat Heltzel Steel Forms when it comes to service, dependability and extra long wear.

Make your next forms Heltzel, and you, too, will understand why more and more of America's leading contractors specify Heltzel all along the line.

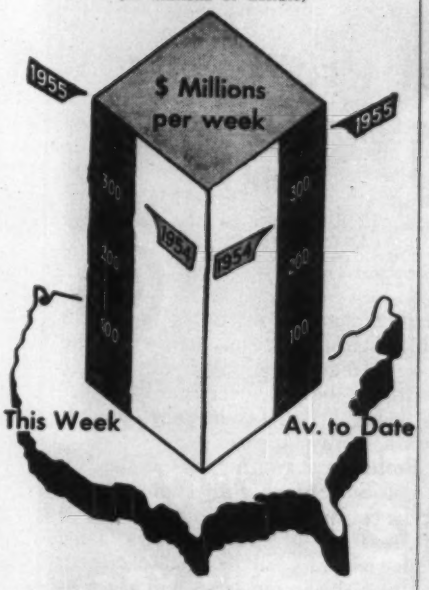
Heltzel builds a complete line of sidewalk, curb, curb and gutter, highway, airport, foundation and special steel forms.

THE HELTZEL STEEL FORM & IRON COMPANY

59000 Thomas Rd., WARREN, OHIO

Activity This Week

As reported to ENR
(In millions of dollars)



Amount of contracts let

(millions of dollars)

By Ownership	This Week	Cumulative 46 wks 1955	1954	% chge
Federal	$31.5	$1,513.5	$1,158.0	+31
State and municipal	62.3	4,675.3	4,424.7	+6
Total public	93.8	6,188.8	5,582.7	+11
Total private	307.9	10,534.5	7,201.7	+46
U. S. Total	$401.7	$16,723.3	$12,784.4	+31
By type of work				
Waterworks	$2.9	$240.7	$217.3	+11
Sewerage	4.6	346.9	351.5	−1
Bridges	10.7	432.9	452.6	−4
Highways	24.4	1,910.0	1,704.8	+12
Earthwork, waterways	5.5	490.2	283.9	+73
Buildings:				
Public, excl. hsg.	19.5	1,530.2	1,563.3	−2
Public housg.	0.5	239.3	233.5	+2
Private housg.	96.1	5,595.6	3,809.6	+47
Commercial	38.5	1,513.4	1,244.7	+22
Industrial	67.4	2,564.8	1,626.0	+58
Unclassified	131.6	1,859.3	1,297.2	+43
U. S. Total	$401.7	$16,723.3	$12,784.4	+31

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

New capital for construction

(millions of dollars)

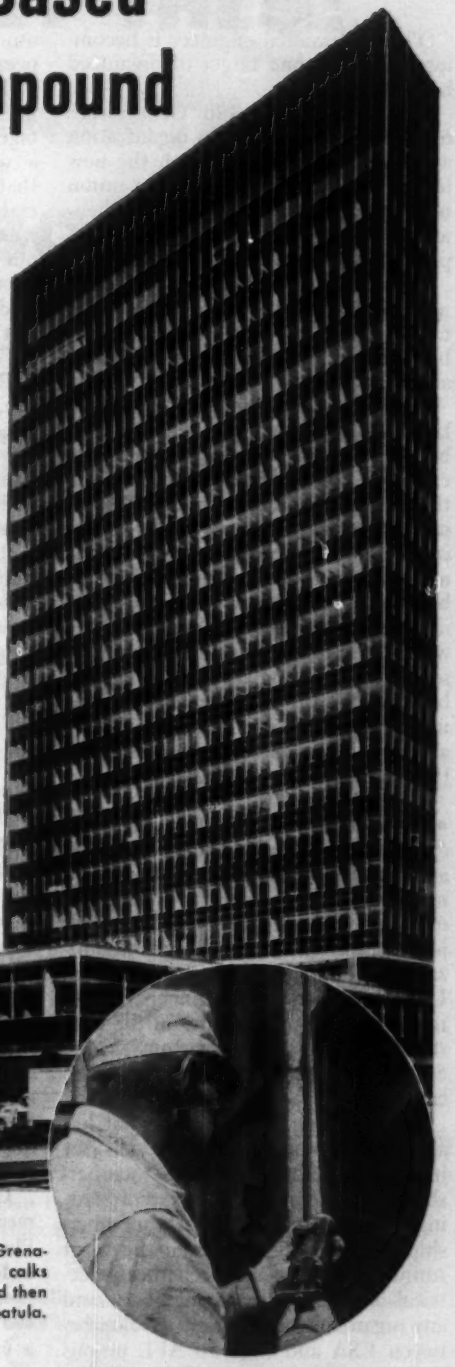
	Week of Nov. 10	Cumulative 45 Wks 1955	% Chge '54-'55
Corporate securities	$150.3	$3,116.4	+26
State and municipal:			
All except housing	136.8	4,115.3	−13
Housing	7.8	93.0	+2
Federal loans	3.5	120.1	+14
Federal aid	...	853.5	+27
Total nonfederal	$298.4	$8,298.2	+3
Federal appropriations:			
In U. S.	...	$3,379.7	+63
Outside U. S.	...	84.6	+155
Total new capital	$298.4	$11,762.6	+15

ENR cost and volume indexes, 1955

		Base years = 100 1913	1926	1949
Construction cost	11/10	672.76	323.40	141.03
	11/3†	673.20	323.61	141.13
Building cost	11/10	478.86	258.86	136.12
	11/3†	479.30	259.10	136.25
Volume	Oct.	628	255	182
	Sept.	576	234	166

† Official Indexes for Nov.

Lever House Weatherproofed with THIOKOL-Based Glazing Compound



Due to the differing expansion rates of metal and glass, and the constant channeling of rainfall at the joints, the original glazing compound used in Lever House did not produce the desired effect.

Faced with a severe leakage problem, the Building Service Director chose Tremco "Lasto-Meric", a compound based on "Thiokol" Liquid Polymer, as a suitable established replacement.

His choice was made on the basis of the performance of "Thiokol" Liquid Polymer — a solventless liquid that converts entirely to a rubber at room temperature and insures a tenacious, durable seal even after years of weathering. It maintains resilience and adhesion from 250° above to 65° below zero.

Investigate "Thiokol"-based materials before you specify your glazing or caulking compound and save costly future replacement. Information on this case will be sent to you on request. WRITE: THIOKOL CHEMICAL CORPORATION, 784 North Clinton Avenue, Trenton 7, New Jersey. IN CANADA: Naugatuck Chemical Div., Dominion Rubber Company, Elmira, Ontario.

Thiokol Chemical Corporation manufactures "Thiokol" Liquid Polymer only as a raw material. The Tremco "Lasto-Meric" is a product of Tremco Mfg. Corp., Cleveland, Ohio.

Skilled mechanic of the Grenadier Corp., NYC, pressure calks "Lasto-Meric" into joints and then tools it into place with a spatula.

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PIONEER MANUFACTURERS OF SYNTHETIC RUBBER

Engineers: High on Labor's List of Prospects

AFL-CIO merger will spark new organization campaigns; and ESA insists it won't be enticed into trade union fold

The professional engineer is becoming a number one target of organized labor.

When the AFL and CIO merge next month, emphasis on organization will be increased within both the new federation and the independent union of Engineers and Scientists of America. Civil engineers have already been placed on the active list of prospects.

So far, the campaign to attract engineers into labor's fold is still in the talking stage. Formal plans have not been drawn up, but the implications are clear.

The historic alliance of organized labor promises to increase the rivalry between unions now competing for engineers, instead of consolidating their efforts. Pitted against each other in the forthcoming crusade to organize the unorganized will be the trade union forces that want the engineer to become a part of the organized labor movement and the independent ESA which would keep the engineer in a separate bargaining category. Fighting both will be the professional engineering societies, which feel that any labor alliance, however limited, will injure the engineer's professional status.

• **Competition's keen**—And there's a chance that two AFL unions will scrap among themselves to sign up engineers. One, the American Federation of Technical Engineers, claims full jurisdiction within the merged organization but the other, the International Union of Operating Engineers, has already invaded the territory in the construction industry (ENR June 23, p. 80) and appears likely to continue the campaign.

Contributing to the rivalry that lies ahead is the fact that ESA has set its sights on expanding its membership of civil engineers—now representing an estimated 10% of its membership. So far, ESA has been the front runner in signing up mechanical, electrical and aeronautical engineers, and any organizing clashes that develop between ESA and the two AFL unions operating in the same field stand a good chance of centering on civil engineers.

In addition, various industrial union affiliates, such as the CIO's United Auto Workers and electrical workers unions will be out to organize engineers in their own units.

Thus, organized labor is going after the engineer from a number of vantage points. Eventually, it will mean a quick acceleration of a campaign that's been going on for the past several years and which has succeeded in winning over only an estimated 60,000 out of a possible total of 300,000 engineers in industry that could be organized under terms of the Taft-Hartley Act.

• **The merger?**—Despite the fact that the question of a proposed alliance between ESA and the merged AFL-CIO was raised at ESA's Third Annual Convention earlier this year, ESA President Joseph Amman says his organization is not now considering an affiliation with the AFL-CIO. He notes, to the contrary, that ESA seeks to avoid the union label in order not to antagonize the engineer and that it bargains on a completely different basis from other unions.

Instead of showing concern about the prospective organizing attempts of AFL and CIO unions in ESA territory, Amman claims the merger will boost his membership roles. When the engineer is faced with organizing pressure by the AFL-CIO, he says, "he'll come into our units. He doesn't want to be part of the united labor movement."

Russell Stephens, AFTE president, predicts, to the contrary, that ESA will eventually team up with the merged federation. "When they see what the merged federation can do," he states, "they'll come over. If not, they'll be disregarded."

Professional groups, such as the National Society of Professional Engineers, continue to fight all attempts at unionization of the engineer. They argue, with a great deal of success so far, that the union label will react to the disadvantage of the engineer, both as to his personal and professional prestige and his relationship with his firm.

• **Some views on unionization**—Labor's top leaders view the engineer as a future member of their forces. AFL President George Meany says: "Far from being 'undignified' or 'degrading,' union membership has directly enhanced the standing of engineers in our society. . . . " And CIO President Walter Reuther predicts, that as members of his United Auto Workers advance in skills, they'll move into the engineering categories as members of the UAW.

ESA President Amman discounts this viewpoint. He claims the engineer needs separate representation; that he would be swallowed up in any giant labor alliance and his professional status watered down by combining with production workers.

Noting one big distinction, Amman points out that ESA bargains on an entirely different basis from industrial unions through its stated policy of fighting for merit increases. Each ESA unit has a bargaining system calling for a management fund "kitty" to be set aside for special pay raises to reward special work, compared with AFL-CIO affiliates which bargain for wage levels and usually fight merit raises.

• **Already started**—None of the unions, however, is sitting back waiting for the whistle to blow to start the organizing drive.

ESA did some of the spade work at

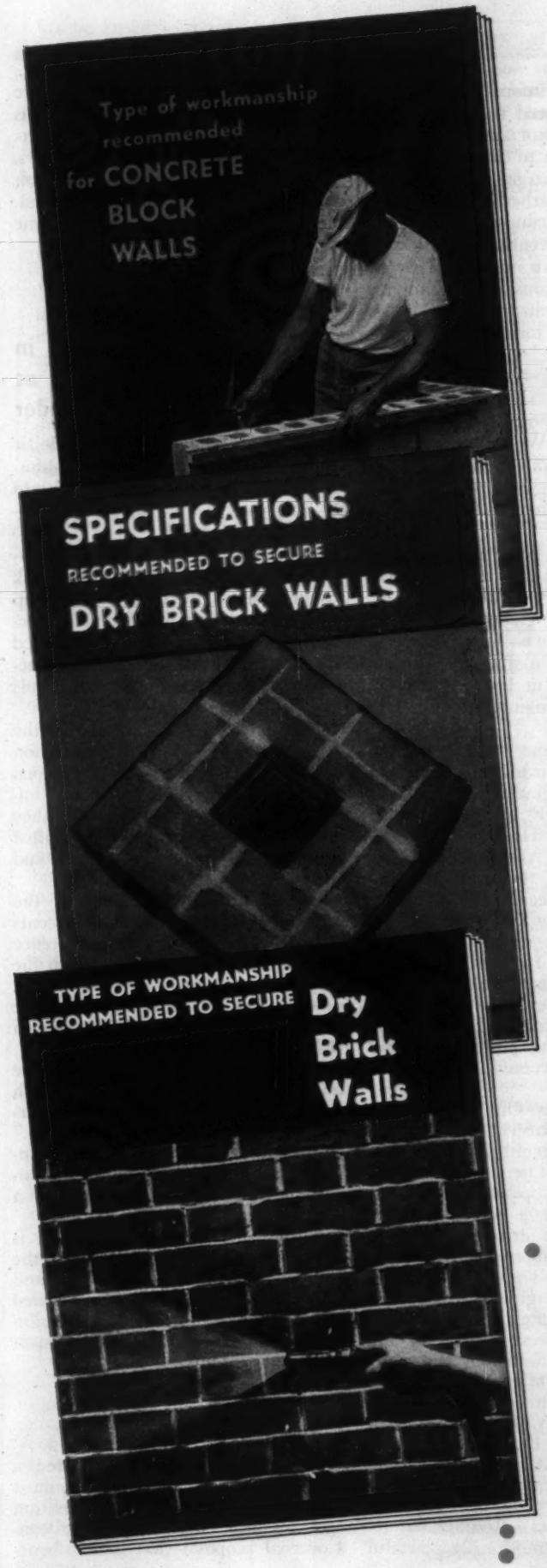
(*Continued on page 106*)

Some New Joint Ventures

Contractors and unions in the plumbing and pipe fitting industries of Seattle, Wash., and Denver, Colo., have joined forces in new public relations programs to promote their welfare.

Principal purpose of the Seattle venture is to promote the sale of hot water heating systems. Sponsored by contractors, suppliers, manufactures' representatives and Local 32 of the plumbers and pipe fitters union, the program also seeks to improve the skills of journeymen through additional training.

Denver's new Pipe Industry Development Fund, formed by members of the Plumbing Contractors and Heating, Piping and Air Conditioning Contractors Associations and Local 3 and 208 of the plumbers and pipe fitters unions, will be financed by a five-cent employer and union contribution for each man-hour worked. Its aims: public education to induce the installation of safer, more economical and more modern plumbing systems; better labor relations; and higher apprenticeship standards.


Type of workmanship recommended for CONCRETE BLOCK WALLS
SPECIFICATIONS
RECOMMENDED TO SECURE
DRY BRICK WALLS
TYPE OF WORKMANSHIP RECOMMENDED TO SECURE
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THE three books at the left are a "must" for anyone who is interested in good masonry construction. One describes the type of *workmanship* recommended to secure dry brick walls. The second describes the *specifications* recommended to secure dry brick walls. The third describes the type of workmanship recommended for *good concrete-block walls.*

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BRIXMENT FOR MORTAR

Louisville Cement Company—Dept. 6
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Without cost or obligation, please send me a copy of each of your three books on masonry construction.

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- ★ Trolley Frames and Trucks
- ★ Rigid Frames
- ★ Roll-Over Fixtures
- ★ Tank Turrets
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its annual convention, where major emphasis was placed on organization in setting up its program for the coming year. In order to carry its expanding activities in this field, as well as to support its legislative efforts, a one-dollar per membership assessment was levied by the convention.

Currently active in several areas, ESA has made considerable progress in the railroad industry, where it has won members on four lines, including the Great Northern. It is now campaigning for engineers on the New York Central and has its eyes on General Motors and Ford engineers. It is bucking the UAW for members at Stewart-Warner in Indianapolis and is competing with the operating engineers in San Francisco and southern California.

Plans are now being drawn up for an ESA campaign directed at the federal government's 47,000 engineers. Here, the largest group of prospects is civil engineers, who are estimated to number 12,600. In size, electrical engineers are next in line with 9,100, and mechanical engineers follow with 6,000.

The AFL unions have also been active. In addition to the activities of the operating engineers on the West Coast, the AFTE has been taking soundings in the Houston area. Operating out of the AFL building trades office in Houston, the union has tried to organize engineers at the Freeport, Tex., plant of Dow Chemical Co. and at Lummus Co., refinery machinery manufacturers in Houston. Overtures have also been made to professional engineers of Freese, Nichols & Turner, consulting engineers in Houston. So far, efforts on the professional level have not been successful.

• **No-raiding pacts**—Out of the competition for engineers, however, has come a certain amount of cooperation.

In Portland, Ore., for example, AFTE and the operating engineers have worked out a no-raiding pact with ESA, whose drive in that area centers on civil engineers. Under the agreement, ESA is given jurisdiction over those civil engineers who fall in the professional category.

In the Southwest, ESA and the CIO oil, gas and chemical workers are conducting similar negotiations in their respective efforts to organize the petroleum industry. But these pockets of cooperation are the exception rather than the rule. At the present time, there's little indication that they will spread as a result of the merger.

Until what CIO's Reuther has referred to as the emotionally powerful and dynamic forces of the merger have had a chance to work, the various unions that are interested in engineers will continue to go their separate ways. And as the emphasis on organization of the unorganized builds up steam, the professional engineer will become an increasingly important target.

Teamsters' Strike

Thousands still idle in Southern California as NLRB and courts ponder

Last week, the multi-million-dollar teamsters' strike in Southern California's rock products industry rolled into its fifth week as the stalemate deepened.

Called on Oct. 3 against 29 members of the Southern California Rock Products Assn., the strike has tied up millions of dollars worth of construction (ENR Oct. 27, p 109), has idled 57,000 members of the basic construction trades, and has thrown thousands more in the subtrades out of work.

In an effort to stop the strike, the employers asked for an injunction against the teamsters, but the federal court hearing has been postponed until Nov. 21. At the same time, they filed a $5-million damage suit against the local union, the international and their officers.

Big stumbling block is still the teamsters' pension demands—10 cents an hour to the Western Conference of Teamsters Pension Plan, which the employers have attacked as illegal both in their suit for damages and in the NLRB complaint they filed last month (ENR Nov. 3, p. 98).

In another legal ramification, the union last week filed a complaint with the NLRB, charging the employers with "refusal to bargain in good faith." Reason for the action, say the teamsters, is the employers' refusal to bargain on other issues until the pension demands are withdrawn.

Meanwhile, the union claims it is "willing to consider any offer from the companies regarding pensions" and says if the pension plan is declared illegal, it will abandon its pension demand or amend the plan to meet legal requirements.

Ohio Voters Turn Down Bigger Jobless Benefits

Ohio voters last week rejected a chance to get the nation's most liberal unemployment compensation law by defeating the CIO's controversial proposal that jobless bene-

fits be raised to a maximum of $50 for 39 weeks.

Earlier this year, the state legislature had boosted unemployment benefits from $30 to $33 for 26 weeks. Termed inadequate by the CIO, it led to the referendum measure sponsored by labor.

Defeat of the proposal also struck a blow at guaranteed annual wage plans in a state which contains 20% of the General Motors work force and 11.9% of the Ford workers. Tied into the proposal was a provision to integrate GAW payments with unemployment compensation benefits.

Following the defeat, the CIO said it would continue to seek a boost in jobless benefits and would renew its efforts to clear the decks for guaranteed annual wage plans.

Shorter Work Week

A six-hour day is goal of Canadian carpenters

Organized labor in British Columbia made its first official overture for a 30-hour week, when United Brotherhood of Carpenters (AFL-TLC) voted to seek a 10-hour reduction in the present work week at the convention of the Provincial Council of Carpenters in Pentieton.

The 30-hour week is in line with provincial and national aims of all Trades and Labor Congress unions, but this is the first time it has evolved as an official, immediate objective. The resolution, passed unanimously at the convention, was fully supported by all top officials of the Trades Union Congress (the provincial group of TLC unions).

George Bengough of Vancouver, president of the council, said the shorter work week is expected to be a major demand in 1957 negotiations for a province-wide contract with big contractors, although first repercussions will be felt on Vancouver Island when contracts are reopened with members of Victoria Building Industries Exchange.

A standard six-hour, five-day work week with no reduction in take-home pay is called for by the resolution. In support of the action, it's claimed that technological improvements have greatly increased per capita production.

The convention also laid the groundwork for a campaign to increase wages and improve working conditions in the three western provinces but no definite wage target was set. Another demand in new contracts will be a health and welfare scheme with equal employer and employee contributions.

OFFICIAL PROPOSALS

Bids: November 30, 1955

Power Authority of the State of New York

ST. LAWRENCE POWER PROJECT
ADVERTISEMENT FOR PROPOSALS
FOR
THE FURNISHING AND DELIVERY OF INTAKE, SERVICE AND EMERGENCY GATES
FOR
BARNHART ISLAND POWER PLANT AND MASSENA INTAKE
SPECIFICATIONS NO. PA-5-15054
ST. LAWRENCE CONTRACT NO. P24

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the manufacture and furnishing of forty nine (49) Intake Gates for the Barnhart Island Power Plant, and four (4) Service and (4) Emergency Gates for the Massena Intake and delivery thereof f.o.b. the Authority's Classification yard, Massena, New York in the following ways:

(1) If brought in person, on the day of receiving bids until 10:30 A.M. Eastern Standard Time on the 30th day of November, 1955, 270 Broadway, Hearing Room C on the sixth floor, New York 7, New York.

(2) If mailed in, until 10:15 A.M. Eastern Standard Time, on the 30th day of November, 1955, at the Authority's office, 270 Broadway, Room 1300, New York 7, New York.

The proposal will be publicly opened and read aloud at the time and at the address given in (1) above.

Bids will be entertained for forty nine gates, eight gates, or fifty seven gates in accordance with the bid schedule. The total weight of all gates is approximately 3500 tons. Erection at the site of installation will be done by others.

Bids will not be restricted to American manufacturers.

Plans, specifications and proposal forms for the work will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and the Hydro Electric Power Commission of Ontario, 620 University Avenue, Toronto 2, Ontario, and may be inspected by prospective bidders during office hours, and may be obtained from the Power Authority of the State of New York, 270 Broadway, Room 1300, New York 7, New York upon application and prepaying of a fee of Twenty ($20.00) Dollars per initial set of contract documents and Ten ($10.00) Dollars per set for additional sets, no part of which will be refunded. Two sets must be returned with each bid.

Bids must be made in duplicate upon the proposal forms included in and bound with the Contract Documents. A bid deposit will be required with each bid in an amount of not less than 10 percent of the maximum price bid for any bid schedule.

The right is reserved to reject any or all bids.

W. S. CHAPIN
General Manager

PA-5-15054
10-31-55

Bids: November 30, 1955

City of New Rochelle, N. Y. Department of Public Works

INVITATION TO BIDDERS

1. Sealed bids will be received by the DIRECTOR OF PUBLIC WORKS of the CITY OF NEW ROCHELLE, N. Y., at the COUNCIL CHAMBER, CITY HALL, 515 Main St., New Rochelle, N. Y., until 10:00 A.M. Eastern Standard Time NOVEMBER 30, 1955, for the construction of:

A SECTION OF THE
STEPHENSON BROOK STORM WATER DRAIN BETWEEN
STATION 30+00 AND 33+50
(N. Y., N. H. & H. R. R.—New England Thruway Crossing)
(Project No. 26-828-P2)
In The
CITY OF NEW ROCHELLE, N. Y.

in accordance with the Plans, Specifications and Contract Documents on file in the BUREAU OF ENGINEERING, 28 Wildcliff Drive, New Rochelle, N. Y., where they may be examined on and after October 31, 1955.

2. Each bid must be accompanied by a DEPOSIT in the form of certified check or cashier's check, made payable to the CITY OF NEW ROCHELLE, N. Y. in the amount of Twenty Thousand Dollars ($20,000.00). Bid bonds or cash will not be accepted. Each Bidder is required to submit a proposal for each of the two Alternate schemes. No bid will be accepted unless it contains two such proposals.
3. Copies of Plans, Specifications and Contract Documents may be obtained at the BUREAU OF ENGINEERING beginning October 31, 1955, upon payment of TWENTY DOLLARS ($20.00) *in cash* for each set. Upon return of all such documents in good condition within *one week* after the bidding date, TEN DOLLARS ($10.00) will be refunded. If all such documents are not returned within the specified time, the entire cash payment will be forfeited. The City reserves the right to reject any or all bids.

E. H. FELDMAN
DIRECTOR OF PUBLIC WORKS
Date: October 28, 1955

OFFICIAL PROPOSALS

Bids: December 6, 1955

Power Authority of the State of New York

ST. LAWRENCE POWER PROJECT
ADVERTISEMENT FOR PROPOSALS
FOR
THE FURNISHING AND DELIVERY OF UNIT CONTROL BOARDS
SPECIFICATIONS NO. PA-5-14017
ST. LAWRENCE CONTRACT NO. P30

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the design, manufacture and furnishing of sixteen (16) Unit Control Boards and delivery thereof, f.o.b. the Authority's classification yard Massena, New York, as follows:

(1) If brought in person on the day of receiving bids until 10:30 A. M. Eastern Standard Time on the 6th day of December, 1955, 270 Broadway, Hearing Room C on the sixth floor, New York, New York.

(2) If mailed in until 10:15 A. M. Eastern Standard Time on the 6th day of December, 1955, at the Authority's office, 270 Broadway, Room 1300, New York 7, New York.

The proposals will be publicly opened and read aloud at the time and at the address given in (1) above. Bids will be entertained for the Unit Control Boards and services in accordance with the bidding schedule. Erection at the site of installation will be done by Others but services of erecting engineers shall be provided by the manufacturers if and when required. Delivery of the Unit Control Boards, will be required in groups of 4 every six months starting September 1, 1957.

Plans, Specifications and Proposal Forms for the work will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and the Hydro-Electric Power Commission of Ontario, 620 University Avenue, Toronto 2, Ontario, and may be inspected by prospective bidders during office hours, and may be obtained from the Power Authority of the State of New York, 270 Broadway, Room 1300, New York 7, New York, upon application and prepayment of a fee of Ten ($10.00) dollars per initial set of contract documents and Five ($5.00) dollars per set for additional sets, no part of which will be refunded. Two sets must be returned with each bid.

Bids will not be restricted to American manufacturers.

Bids must be made in duplicate upon the proposal forms included in and bound with the Contract Documents. Bid deposit will be required with each bid in an amount not less than 10 percent of the gross sum bid.

The right is reserved to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

PA-5-14017
10/31/55

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4565) will be received at Ephrata, Washington, until December 21, 1955, for furnishing labor and materials for earthwork, concrete lateral lining, and structures, East Part Block 89, laterals, wasteways, and drain, West Canal Laterals, Columbia Basin Project, Washington. Location south of Ephrata, Washington. Principal items are 262,000 cu. yds. excavation; 6,800 cu. yds. concrete; 9 pumping units and accessories; various gates, piping, metalwork; and other work. Completion time 310 days. For particulars, address Bureau of Reclamation, P. O. Box 368, Ephrata, Washington; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $1.80 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record, 330 West 42nd Street, New York 36, N. Y.

Bids: December 1, 1955

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, and Article 2, Title 9 of the Public Authorities Law, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time on the 1st. day of December 1955, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

Contract No.	County	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 2, Lacy Ketchum, District Engineer, 109 North Genesee Street, Utica, N. Y.						
M.T. 55-11	Montgomery	New York State Thruway Mohawk Section—Subd. 14 Alteration to Pedestrian Underpass	0.13	Asphalt Conc.; Opt.	$500 Plans $10	$10,000
DISTRICT No. 5, E. G. H. Youngmann, District Engineer, 65 Court Street, Buffalo, N. Y.						
E.T. 55-13 S.T. 55-15	Chautauqua	New York State Thruway—Erie Section, Subd. E5 (Rte. 20 to 4 Mi. Level Road) The Rte. 5 and 20 Interchange & Service, Access and Crass Roads	3.60	9" Two Crse. Cem. Conc. Pavt. Var. Wide=2.86 Mi. Cem. Conc. Pavt.=0.10 Mi. Asph. Conc., Opt.=0.51 Mi. Misc. Work=0.13 Mi. 2 Hy. Seps. Comp. I-Beams 159.5' & 205.5'	$85,000 Plans $25	$1,174,000
E.T. 55-14 S.T. 55-16	Erie	New York State Thruway—Erie Section, Subd. E-7A (Evans Ctr.—Eden Rd. to Camp Rd.) & Service & Cross Rds.	8.03 (3.08) (Acc.)	9" Two Crse.Cem. Conc. Pavt. 2@ 25' Wide=7.95 Mi. Asp. Conc., Opt.=3.08 Mi. Misc. Work=0.08 Mi. 6 Hy Grade Seps. Comp. I-Beam, 2 @ 162', 1 @ 350.6', 2@ 212.3', 1@ 252.2'	$230,000 Plans $50	4,216,000
DISTRICT No. 8, J. S. Bixby, District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.						
TSP RC 55-1	Columbia & Dutchess	Taconic State Parkway, Section 7, Pts. 3 & 8, Section 9A, Pts. 1 & 2 & Section 9B, Pt. 1	12.29	Washout Repairt & Misc. Work	$4,000 Plans $10	73,000
DISTRICT No. 10, M. E. Goul, District Engineer, Mantauk Highway at Little East Neck Road, Babylon, L. I., N. Y.						
PSC 7278 8966	Nassau	Eliminations of Grade Crossings of the Long Island Railroad with Various Streets in Hamlet of Baldwin and Village of Freeport	0.34 (1.56) (R.R.)	Railroad Relocation=1.56 Mi. Asph. Conc., Opt.=0.25 Mi. Cem. Conc. Pavt.=0.09 Mi. 4 Plate Girders 86', 85.5', 69' and 76.5' 1 Viaduct and Station 920'	$182,000 Plans $100	3,415,000

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders."

The right is reserved to reject any or all bids.

SUPT. OF PUBLIC WORKS
JOHN W. JOHNSON

Bids: December 6, 1955

Power Authority of The State of New York

ST. LAWRENCE POWER PROJECT
ADVERTISEMENT FOR PROPOSALS
FOR
THE FURNISHING AND DELIVERY OF EMERGENCY DIESEL-GENERATOR SET AND APPURTENANCES
SPECIFICATIONS NO. PA-5-14027
ST. LAWRENCE CONTRACT NO. P26

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the design, manufacture, and furnishing of one (1) stationary emergency diesel-generator set and appurtenances and delivery thereof f.o.b. cars at destination, in the following ways:

(1) If brought in person on the day of receiving bids, until 2:30 P.M. Eastern Standard Time on the 6th day of December, 1955, Hearing Room C on the 6th floor, 270 Broadway, New York, New York.

(2) If mailed in, until 2:15 P.M. Eastern Standard Time on the 6th day of December, 1955, at the Authority's office, 270 Broadway, Room 1300, New York 7, New York.

The proposals will be publicly opened and read aloud at the time and at the address given in (1) above. Bids will be entertained for the emergency diesel-generator set, appurtenances and services in accordance with the bidding schedule. Erection at the site of installation will be done by Others but services of erecting engineers shall be provided by the manufacturer if and when required. Delivery of the diesel-generator set will be required by April 1, 1056.

Plans, Specifications and Proposal Forms for the work will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and the Hydro-Electric Power Commission of Ontario, 620 University Avenue, Toronto 2, Ontario, may be inspected by prospective bidders during office hours, and may be obtained from the Power Authority of the State of New York, 270 Broadway, Room 1300, New York 7, New York upon application and prepayment of a fee of Ten ($10.00) dollars per initial set of contract documents and Five ($5.00) dollars per set for additional sets, no part of which will be refunded. Two sets must be returned with each bid.

Bids will not be restricted to American manufacturers.

Bids must be made in duplicate upon the proposal forms included in and bound with the Contract Documents. A bid deposit will be required with each bid in an amount not less than 10 percent of the gross sum bid.

The right is reserved to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

PA-5-14027
11/10/55

Bids: November 30, 1955

Sanitary Trunk Sewer

LEGAL NOTICE

SEALED PROPOSALS will be received at the office of the DIRECTOR OF PUBLIC SERVICE, AKRON, OHIO, until 12:00 o'clock noon (Eastern Standard Time) Wednesday November 30, 1955 for the construction of the:

MUD RUN SANITARY TRUNK SEWER
FROM
LEESER AVENUE
TO
HAWKINS AVENUE

Drawings, specifications and blank proposals can be obtained at the office of the Engineer of the Division of Sewerage, by making a deposit of Five Dollars ($5.00). This deposit will be refunded if a proposal is submitted and the drawings are returned in good condition, within five days after the date the proposals are received.

Each proposal must contain the full name of the party or parties making the same, and all persons interested therein, and must be accompanied by a certified check in the sum of Five (5) per cent of the total bid on a solvent bank, as a guarantee that if the proposal be accepted, a contract will be entered into.

Bidders must use the printed form, as none other will be accepted.

The Director of Public Service reserves the right to reject any or all bids.

THE CITY OF AKRON, OHIO
BY Leo G. Walter
Director of Public Service

United States Department of Commerce, Bureau of Public Roads, November 10, 1955. SEALED BIDS will be received at the office of the Bureau of Public Roads, Room 4009, General Services Building, Washington 25, D. C., until 2:00 p.m., e.s.t., December 15, 1955, for construction of Inter-American Highway Projects 75-56-3A (Roadway) and Project 75-56-3B (Bridges), in the Republic of Costa Rica, between San Ramon and the northern border of Costa Rica. Bidders may submit bids on following alternate basis: Alternate "A" for Roadway items only; Alternate "B" for Bridge items only; Alternate "C" for Roadway and Bridge Items combined on all-or-none basis. The approximate quantities of the more important work are: ROADWAY: 640,000 cubic meters Roadway Excavation; 445,000 tons Crushed Gravel or Stone Base Course; 1,066,000 square meters Reconstructed Base Course; 1,460,000 square meters Asphalt Road Mix Surface; 11,700 tons cut-back asphalt. BRIDGES: 7,700 cubic yards Structure Excavation; 6,800 cubic yards Class "A" Concrete; 316 tons Reinforcing Steel furnish and place; 198 tons Reinforcing Steel-place only; 436 tons Structural Steel furnish and erect; 398 tons Structural Steel erect only; 1,200 lineal feet timber foundation piling. Special conditions of work performed by U. S. Government in foreign areas apply as well as local laws. Plans, Specifications and Proposal Forms are available upon request at the address given above, or Bureau of Public Roads, Fifth Floor, Gran Hotel Costa Rica, San Jose, Costa Rica. C. D. Curtiss, Commissioner.

OFFICIAL PROPOSALS

Bids: November 29, 1955

State of New Jersey
State Highway Department
Trenton

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

ROUTE 6(1927) U. S. 46 (1953), SEC. 7-E Route 6 (1927) Route U. S. 46 (1953), Section 7-E, Drainage Improvement near overpass at Erie Railroad, Saddle River Township, Bergen County. The principal item of work is:

180 lin. ft. Liner Plate Tunnel

Bids for the above will be received at the office of the State Highway Department, in the CAFETERIA, State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, November 29, 1955, at TEN o'clock (10:00 A. M.-EASTERN STANDARD TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plan and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans and supplementary specifications will be furnished upon payment of a fee of FIFTEEN DOLLARS ($15.00) for each set upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J., with a check drawn to the order of the State Highway Department. A charge of $5.00 will be made for supplementary specifications unaccompanied by construction plans. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by the following documents: (1) a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00; (2) a proposal bond for a sum of not less than fifty percent (50%) of the total price bid for the project; (3) a financial statement (Part 1 of the Prequalification Questionnaire); (4) a plan and equipment statement (Part 3 of the Prequalification Questionnaire); and (5) a Non-collusion Affidavit executed in **duplicate**; and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed:
STATE HIGHWAY DEPARTMENT
A. Lee Grover, Chief Clerk

Bids: December 7, 1955
(Advertisement)

SEWAGE TREATMENT PROJECT
OF THE
HICKORY TOWNSHIP MUNICIPAL AUTHORITY
Mercer County, Pennsylvania

Sealed proposals will be received at the office of the Solicitor of the Hickory Township Municipal Authority, 313-314 First National Bank Building, Sharon, Pennsylvania until 2:00 P.M., E.S.T. December 7, 1955, and will be publicly opened and read shortly thereafter at the Township Commissioners Board Room at the Maple Drive School, Maple Drive and East State Street, Hickory Township, Mercer County, Pennsylvania, for furnishing all necessary labor, material and equipment and performing all work for the construction noted below.

Proposals will be received upon seven (7) separate parts of the project as hereinafter indicated. Each proposal shall be accompanied by a certified check payable to Hickory Township Municipal Authority or a bid bond in an amount not less than ten (10) percent of the total bid in accordance with the provisions of the Contract Documents.

Copies of the Contract Documents including the Drawings and Specifications will be on file for inspection purposes at the office of Gannett Fleming Corddry and Carpenter, Inc., 6218 Penn Avenue, Pittsburgh, Pennsylvania; at the office of the Hickory Township School District's Superintendent's office at the Maple Drive School Building, Maple Drive and East State Street, Hickory Township, Mercer County, Pennsylvania; and also at the office of Gannett Fleming Corddry and Carpenter, Inc., 600 North Second Street, Harrisburg, Pennsylvania.

Copies of the Contract Documents, including Drawings and Specifications, not to exceed two (2) sets of any particular Contract to a prospective bidder, may be obtained only from that office of Gannett Fleming Corddry and Carpenter, Inc., that is located at 6218 Penn Avenue, Pittsburgh, Pennsylvania, (Post Office Box 5073, Pittsburgh 6, Pennsylvania), upon deposit of the following stated amounts for each set:

Contract One: CONSTRUCTION OF A SEWERAGE SYSTEM..$35.00
(Part A): Construction of Outfall Sewer, Main Trunk Sewer, a portion of West Trunk Sewer, and Branch Sewers
(Part B): Construction of a portion of West Trunk Sewer, Branch Sewers and Force Main
(Part C): Construction of East Trunk Sewer, North Trunk Sewer, Branch Sewers and Force Main
Contract Two: GENERAL CONSTRUCTION OF A SEWAGE TREATMENT PLANT, PUMPING STATION, EJECTOR STATION, ROADS AND APPURTENANCES.....$20.00
Contract Three: PLUMBING WORK IN CONNECTION WITH CONSTRUCTION OF A SEWAGE TREATMENT PLANT AND PUMPING STATION...$20.00
Contract Four: HEATING WORK IN CONNECTION WITH CONSTRUCTION OF A SEWAGE TREATMENT PLANT..$20.00
Contract Five: ELECTRICAL WORK IN CONNECTION WITH CONSTRUCTION OF A SEWAGE TREATMENT PLANT, PUMPING STATION AND EJECTOR STATION.....$20.00

Full refund will be made only to actual bidders on the five (5) prime contracts noted above, for return of one (1), no more, of each set in good condition within ten (10) calendar days after closing date for receipt of bids; refund for return of all other sets, in good condition, within the same period, will be fifty (50) percent of deposit.

HICKORY TOWNSHIP MUNICIPAL AUTHORITY
Hickory Township
Mercer County, Pennsylvania
Gannett Fleming Corddry &
Carpenter, Inc., Engineers
6218 Penn Avenue
Post Office Box 5073
Pittsburgh 6, Pennsylvania

Bids: November 29, 1955

State of New Jersey
State Highway Department
Trenton

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

RT. 26 EXT. (1927) U.S. 1 (1953), SECS. 1F & 2H
Route 26 Extension (1927) Route U.S. 1 (1953), Sections 1-F and 2-H, Barrier Curb, from Market Street Ramp to Ohio Avenue, City of Trenton, Mercer County. Length 2.242 miles. The principal items of work are:

Estimated:
10,252 lin. ft. Special Barrier Curb, 24" x 20"
21 sq. yds. White Concrete Island Pavement, 4" thick
330 lin. ft. Wire Rope Fence

Bids for the above will be received at the office of the State Highway Department, in the CAFETERIA, State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, November 29, 1955, at TEN o'clock (10:00 A.M.—EASTERN STANDARD TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plan and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans and supplementary specifications will be furnished upon payment of a fee of FIFTEEN DOLLARS ($15.00) for each set upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, with a check drawn to the order of the State Highway Department. A charge of $5.00 will be made for supplementary specifications unaccompanied by construction plans. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by the following documents: (1) a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00, (2) a proposal bond for a sum of not less than fifty percent (50%) of the total price bid for the project; (3) a financial statement (Part 1 of the Prequalification Questionnaire); (4) a plan and equipment statement (Part 3 of the Prequalification Questionnaire); (5) a Non-collusion Affidavit executed in *duplicate;* and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed:
STATE HIGHWAY DEPARTMENT
A. Lee Grover, Chief Clerk

Bids: December 8, 1955

Power Authority
of the State of New York
Advertisement For Proposals

FOR
CHANNEL IMPROVEMENTS
SPARROWHAWK-TOUSSAINTS
CHANNEL
NEAR OGDENSBURG, ST. LAWRENCE COUNTY, NEW YORK
SPECIFICATIONS NO. PA-5-11007
ST. LAWRENCE CONTRACT NO. 22

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the Channel Improvements at Sparrowhawk Point and Toussaints Island near Ogdensburg, St. Lawrence County, New York in the following ways:

(1) If brought in person on the day of receiving bids until 10:30 A. M. Eastern Standard Time on the 8th day of December, 1955, 270 Broadway, Hearing Room C on the 6th Floor, New York, New York.

(2) If mailed in until 10:15 A. M. Eastern Standard Time on the 8th day of December, 1955, at the Authority's office, 270 Broadway, Room 1300, New York 7, New York.

The proposals will be publicly opened and read aloud at the time and at the address given in (1) above.

The principal items of work are:

Estimated:
12,288,000 cu. yds. Excavation, Common
41,000 cu. yds. Excavation, Rock

The work shall be completed on or before June 1, 1958.

Plans, specifications and Proposal Forms for the work will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and the Hydro-Electric Power Commission of Ontario, 620 University Avenue, Toronto 2, Ontario, may be inspected by prospective bidders during office hours and may be obtained from the Power Authority of the State of New York, 270 Broadway, Room 1300, New York 7, New York, upon application and prepayment of a fee of Ten ($10.00) dollars per initial set and Five ($5.00) dollars per set for additional sets, no part of which will be refunded.

Bids will not be restricted to American contractors. However, dredges and other marine plant shall be registered and built in the United States.

Bids must be made in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 10 percent of the gross sum bid.

The right is reserved to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

OFFICIAL PROPOSALS

Bids: December 20, 1955

Philadelphia, Penna.
Procurement Department
Water Department

Sealed proposals will be received in Room 313, City Hall Annex, until 1:30 P.M., Eastern Standard Time, Tuesday, December 20, 1955, and opened at that time, for the below named contracts:

RECONSTRUCTION OF RAPID SAND FILTERS
AT
QUEEN LANE FILTER PLANT
DESCRIPTION OF WORK

These contracts cover the work involved in the reconstruction of forty rapid sand filters, with a capacity of 120 million gallons daily. The various contracts include the construction and reconstruction work on the filter structures, the construction of a new 725,000 gallon wash water reservoir, together with the necessary work of filter equipment and piping, electrical work, heating and ventilating work, plumbing work, transformer and control equipment and pumping equipment.

Proposal forms, specifications, questionnaires and blueprints may be obtained from the Water Department, in Room 1131 City Hall Annex, Juniper Street and Filbert Street, Philadelphia 7, Penna. A deposit in cash or certified check is required in the amounts stated after each contract, for each set of blueprints and specifications. This deposit will be refunded upon return of the blueprints, unmarked and in undamaged condition within ten (10) days after bids are received.

Bid No. 2500—Contract No. 172-W—Structures $25.00
Bid No. 2501—Contract No. 173-W—Filter Equipment and Piping 15.00
Bid No. 2502—Contract No. 174-W—Electrical System..... 10.00
Bid No. 2503—Contract No. 175-W—Heating and Ventilating..... 10.00
Bid No. 2504—Contract No. 176-W—Plumbing 5.00
Bid No. 2505—Contract No. 666-W—Wash Water Reservoir..... 5.00
Bid No. 2506—Contract No. 667-W—Wash Water and Other Pumping Equipment 5.00
Bid No. 2507—Contract No. 676-W—Transformer and Control Equipment 5.00

No bids will be received unless bidder is qualified by the Procurement Commissioner. The questionnaire form with all questions fully answered must be filed with the Water Commissioner, 1106 City Hall Annex, Philadelphia 7, Penna., at least one (1) week prior to the date of opening bids. Each proposal must be accompanied by security in form and amount as set forth in the proposal.

MICHAEL H. SURA
Procurement Commissioner

Bids: December 8, 1955

Sewage Treatment Plant

ADVERTISEMENT

Notice is hereby given that sealed bids for SECTION H of the Puerto Nuevo Sewage Treatment Plant will be received in accordance with the law by the Puerto Rico Aqueduct and Sewer Authority until 3:00 o'clock P. M. on the eighth day of December, 1955, at the office of the Authority in Santurce, Puerto Rico, and will then be publicly opened and read.

The work comprises furnishing materials and performing the labor for the furnishing and installation of the electrical equipment, controls and wiring for the Puerto Nuevo Sewage Treatment Plant, a primary sewage treatment plant with an initial capacity of twenty-four (24) million gallons per day.

Copies of the plans and specifications may be examined without charge at the office of the Puerto Rico Aqueduct and Sewer Authority, Santurce, Puerto Rico, or at the offices of Buck, Seifert and Jost, Consulting Engineers, 223 Manuel V. Domenech, Street, Hato Rey, Puerto Rico and 112 East 19th Street, New York 3, New York. Copies thereof may be obtained at the office of the Treasurer of the Puerto Rico Aqueduct and Sewer Authority, Stop 26½, Fernandez Juncos Avenue, Santurce, Puerto Rico or at the office of Buck, Seifert and Jost, Consulting Engineers, 112 East 19th Street, New York 3, New York, upon deposit of cash or certified check payable to the Puerto Rico Aqueduct and Sewer Authority in the amount of Fifty ($50.00) Dollars, which sum will be refunded upon return of the plans and specifications in good condition within twenty (20) days after the date on which bids are received or else the entire deposit will be forfeited.

Bids will be received only from persons who have requested the plans and specifications and made the required deposit therefore under their own names. These documents cannot be obtained later than December 6th, 1955.

The principal items of work included in SECTION H are:

Substation of two thousand (2,000) KVA capacity.

Switchgear, control centers, panelboards, transformers and other electrical equipment.

Power, light, control and gauge circuits, wiring, conduit and accessories, lighting fixtures, battery sets, grounding and other equipment and accessories.

Wiring, conduit, connections and accessories for motors and other electrical equipment furnished and installed by others.

Each proposal must be accompanied by a certified check or bid bond from a reliable surety company authorized to do business in Puerto Rico and satisfactory to the Authority in amount equal to ten (10%) percent of the proposal. The certified checks will be retained to pay for any damage or loss to the Authority or the liability bond will accrue in case the successful bidder shall neglect or refuse to enter into a contract in accordance with his proposal.

The Authority reserves the right to consider bids for thirty (30) days after their receipt before awarding any contract and the right is reserved to waive any informalities, to accept any bid or to reject any or all of them.

PUERTO RICO AQUEDUCT
AND SEWER AUTHORITY
By RAFAEL V. URRUTIA
Executive Director

BUCK, SEIFERT AND JOST
Consulting Engineers

Bids: December 16, 1955

Alabama
State Highway Department

NOTICE TO CONTRACTORS

Sealed bids will be received by the State Highway Director at the office of the State Highway Department, Montgomery, Alabama, until 10:00 o'clock A.M., DECEMBER 16, 1955, and at that time publicly opened for constructing the following projects:

ABC No. 16 CLARKE & CHOCTAW COUNTIES: Bridge over Tombigbee River west of Coffeeville consisting of 930' Continuous Truss Span (265'-400'-265') with 1-60' I-beam and 7-80' RCDG Approach Spans.

ABC No. 17 JACKSON COUNTY: Bridge over Tennessee River southeast of Stevenson consisting of 1250' Continuous Truss Span (375'-500'-375') with 5-80' RCDG Approach Spans.

ABC No. 18 CHILTON & COOSA COUNTIES: Bridge over Coosa River west of Rockford consisting of 750' Continuous Deck Truss Span (225'-300'-225') with 2-50' and 1-60' I-beam Spans.

Plans and Specifications are on file in the office of the State Highway Department at Montgomery 4, Alabama.

Plans, proposals and specifications may be obtained only upon payment of a deposit of ten dollars ($10.00) made payable to the Alabama State Highway Department for each project. Alabama laws require prequalification with Alabama Highway Department and license by State Licensing Board for General Contractors before issuance of proposals.

The right to reject any or all bids is reserved.

H. L. NELSON
Highway Director

Bids: November 29, 1955

State of New Jersey
State Highway Department
Trenton

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

ROUTE 29 FREEWAY, SECTION 13-B

Route 29 Freeway, Section 13B, from Aberfeldy Drive to Parkside Ave.; Grading, Bridge & Paving, City of Trenton Mercer County. Federal Project No. U-198(2). Length 1.329 miles. The principal items of work are:

Estimated:

Roadway Items

3,494 cu. yds. Roadway Excavation—Earth
40,000 cu. yds. Wet Excavation
253,034 cu. yds. Borrow Excavation
14,076 sq. yds. Macadam Base Course 7" thick
5,957 sq. yds. Macadam Base Course 4" thick
6,470 sq. yds. Pen. Mac. Inter. Course 3" thick
14,434 sq. yds. Pavement Type MA-BC-1, 2" thick
5,957 sq. yds. Pavement Type MA-BC-2, 3" thick
26,826 sq. yds. Conc. Pavement Surface, Rein. 9" thick
318 sq. yds. Conc. Pavement Surf., Rein. 13½" average thickness
202 sq. yds. Bridge Approach Slabs 18" thick
6,800 lin. ft. Rein. Conc. Culvert Pipe, various sizes
72 Inlets and Manholes
26,320 lin. ft. White Concrete Curb
4,876 lin. ft. Beam Guard Rail

Bridge Items

2,372 cu. yds. Concrete in Structures
83,370 lbs. Reinforcement Steel in Structures
84,550 lbs. Structural Steel

Bids for the above will be received at the office of the State Highway Department, in the CAFETERIA, State Highway Office Bldg., 1035 Parkway Ave., Trenton, N. J., on Tuesday, November 29, 1955, at TEN o'clock (10:00 A.M.—EASTERN STANDARD TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plan and equipment with their bid.

NOTE: The proposed project is a "Federal Aid Project" authorized by the provisions of Title 27 of the Revised Statutes of New Jersey and supplements and by P.L. 350, 83rd Congress, and is to be performed in accordance with the "Required Provisions-Federal Aid Contracts" of the Bureau of Public Roads, Department of Commerce, as outlined in the specifications. The attention of bidders is directed to the special provisions covering subletting or assigning the contract. The minimum wage paid to all common labor employed on this contract shall be $0.75 per hour. The minimum wage paid to all intermediate grade of labor employed on this contract shall be $1.00 per hour. The minimum wage paid to all skilled labor employed on this contract shall be $1.50 per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans and supplementary specifications will be furnished upon payment of a fee of FIFTEEN DOLLARS ($15.00) for each set upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Bldg., 1035 Parkway Ave., Trenton, N. J., with a check drawn to the order of the State Highway Department. A charge of $5.00 will be made for supplementary specifications unaccompanied by construction plans. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by the following documents: (1) a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500. nor more than $20,000.; (2) a proposal bond for a sum of not less than fifty percent (50%) of the total price bid for the project; (3) a financial statement (Part 1 of the Prequalification Questionnaire); (4) a plan and equipment statement (Part 3 of the Prequalification Questionnaire); and (5) a Non-collusion Affidavit executed in duplicate; and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed:

STATE HIGHWAY DEPARTMENT
A. Lee Grover, Chief Clerk

EMPLOYMENT OPPORTUNITIES

The Advertisements in this section include all employment opportunities—executive, management, technical, selling, office, skilled, manual, etc.

Positions Vacant
Positions Wanted
Part Time Work
Civil Service Opportunities....
Selling Opportunities Wanted
Selling Opportunities Offered
Employment Agencies
Employment Services
Labor Bureaus

DISPLAYED —RATES— **UNDISPLAYED**

The advertising rate is $24.25 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

An advertising inch is measured ⅞" vertically on a column—3 columns—30 inches to a page.

Subject to Agency Commission.

$1.80 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.

Box Numbers—counts as 1 line.

Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Not subject to Agency Commission.

Send NEW ADS to ENGINEERING NEWS-RECORD, 330 W. 42nd St., N. Y. 36, N. Y. for December 1st issue closing November 21st

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St, (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

Graduate Civil Engineers or Architectural Engineers not over 27 and single, or if married, willing to move. Must have military training completed and interested in learning the building construction business, starting in the field. We offer opportunity for rapid advancement to ambitious, hard-working young men willing to accept responsibility. Starting salary $92.50 per week if unexperienced with higher rates for those with some experience. Not unusual for our engineers to increase their salary 20% to 25% first year. Send complete history data. Martin K. Eby Construction Co., Inc., 610 N. Main, Wichita 5, Kansas.

Instrument Men—West Indies surveys, plot layout, some development planning send resume, recent photo and salary requirements. P-8209, Engineering News-Record.

Electrical Engineer — As assistant superintendent for Midwest Municipal Electric and Water Utility. Experience in design, planning and operation of 2400/4160 volt distribution systems. Knowledge and experience in steam generation plants desirable. Excellent opportunity for advancement. Age 32-45. P-8214, Engineering News-Record.

Architects and Architectural Draftsmen — Qualified through training and experience to design churches, schools and other buildings. Give full information as to education, experience, salary requirements and when available. Location Eastern New York. Reply P-8242, Engineering News-Record.

Engineers—Experienced in design and preparation of plans for water works and also men experienced in inspection of water works construction. Advise education, experience, salary requirements and when available. Location Eastern New York. Reply Box P-8248, Engineering News-Record.

Assistant City Engineer for Wisconsin City with 15,000 population. Registration as professional engineer in Wisconsin is desirable as appointment as City Engineer may be possible upon retirement of present City Engineer. In first letter, state age, experience, and salary expected. P-8135, Engineering News-Record.

Designers for toll roads and bridges. Experienced and inexperienced men with a civil engineering degree wanted (for a period of about 24 months) in the office of a well known organization in central Pennsylvania. State qualifications, age, salary requirements and availability in first letter. P-8158, Engineering News-Record.

Assistant City Engineer for general municipal work. Send personal data. Salary range $4450-$4930 plus benefits. City Engineer, Watertown, New York.

Graduate Civil engineer with extensive experience and proven ability to serve as project manager for American contractor in South America. Work involves construction of portable water supply system. Contract one year with option of renewal. Submit resume, age, education, experience, references, present salary requirements and availability. Write P. O. Box 51, Panama, R. P.

Registered Architect, for association in Alaska. Potential $12000 plus send resume airmail to Philleo Engineering Service, Box 464, Fairbanks, Alaska.

Industrial bldrs. require exec. gen. supt., job supt., mechanical estimators, exec. secy. State salary, details. P-8306, Engineering News-Record.

ENGINEERS
and
DRAFTSMEN

Growing company expanding engineering division. Opportunities for rapid advancement into management and development work on TV broadcast antenna towers, industrial buildings, aircraft hangars, mechanical parking garages. Liberal benefits, including retirement. Moving expenses paid.

Write
Freeman Mann
DRESSER-IDECO COMPANY
One of the Dresser Industries
875 Michigan Ave.,
Columbus, Ohio

SALES ENGINEERS

A major steel company has need for sales engineers to promote and sell fabricated products in middle Atlantic states. Excellent opportunities for men 25 to 30 years old with engineering background and a desire for sales work. Attractive starting salary with company car, expenses and bonus plan.

P-8324, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

POSITIONS VACANT

Engineering Graduate with concrete paving experience for technical and promotional field work in Eastern Pennsylvania. Permanent. Old-established national organization. Reply should include summary of experience and salary requirements. P-8281, Engineering News-Record.

Estimator—Engineering graduate interested in permanent location in Florida. Young, well established firm specializing in commercial and industrial work. Give personal resume, experience, acceptable starting salary and how soon available. P-8272, Engineering News-Record.

Engineers experienced in water and sewage works projects or related fields. Opportunity for permanent connection with long established consulting firm. Please state full qualifications, experience, references and salary requirements. Location Ohio. P-8294, Engineering News-Record.

Wanted—Young man with technical experience preferably in mining or quarrying. One interested in the field of commercial explosives, their development and sales. Position prmanent with excellent opportunity for advancement. Interview arranged on basis of letter stating qualifications and salary desired. P-8296, Engineering News-Record.

(Continued on page 113)

DESIGNERS
DRAFTSMEN

STRUCTURAL
MECHANICAL
ELECTRICAL

Openings in field of Industrial and Power Plant Design

JACKSON & MORELAND
ENGINEERS
600 Park Square Bldg.
Boston 16, Mass.

ENGINEERS - DESIGNERS - DRAFTSMEN
for work on
BRIDGES AND EXPRESSWAYS

Opportunity for continuous employment in our Cincinnati, Louisville & Chicago offices for graduates or engineers with practical backgrounds. Overtime allowance, paid vacations and holidays, insurance and retirement plan.

Please give detailed personal and experience record, three competent references and salary expected in first letter.

Hazelet & Erdal, Consulting Engineers
Dixie Terminal Bldg.
Cincinnati 2, Ohio

DESIGN ENGINEERS

Immediate Openings
OVERSEAS
On Defense Projects

12 month optional contract
SINGLE STATUS ONLY
Good pay & Accommodations.

Must have degree or equivalent plus 6-10 years experience.

P-8255, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

DESIGN ENGINEERS

PERMANENT OPPORTUNITIES with McKEE

IN OUR REFINERY, METALS OR INDUSTRIAL DIVISIONS AT OUR CLEVELAND, OHIO OFFICES

McKee with more than 50 years of successful operation, doing business all over the world; is one of the largest, oldest and best known engineering and contracting firms in the business. The McKee organization continues to grow and expand, thereby offers many present and future opportunities for qualified and experienced engineers and designers in the following fields:

PIPING
STRUCTURAL STEEL
CONCRETE
PROCESS HEATERS
EQUIPMENT SPECS.
ALSO
ELECTRICAL DRAFTS.
LAYOUT ENGINEERS
PROCESS ENGINEERS

Applicants should have at least five years' of experience.

Here is a rare opportunity for you to utilize your engineering abilities and talents.

McKee offers top compensation commensurate with experience and ability. No age limitations.

Transportation & Moving Allowances

Please Send Resume to:

Edward A. Kolner
ARTHUR G. McKEE & CO.
2300 Chester Ave., Cleveland 1, Ohio

ASSISTANT CHIEF ENGINEER

EXPERIENCED IN DESIGN OF HIGHWAY STRUCTURES, AIRPORTS

Responsibilities: In charge of Engineering Design in district office of consulting engineering firm.

Location—Pennsylvania—Permanent Position—Salary—High—Age 40-55

All replies kept strictly confidential.

P-8197, Engineering News-Record
330 West 42nd St., New York 36, N. Y.

ENGINEERS

HIGHWAYS AND BRIDGES

Designers
Draftsmen
Office Engineers
Maintenance Engineers
Project Engineers
Location Engineers
Soils & Materials Engineers

Domestic and Overseas Assignments
Knowledge of Foreign language necessary in some classifications.

Write, giving full particulars concerning education, experience, personal history and availability to:

Richard L. Shaw
Personnel Director

Michael Baker, Jr., Inc.
Consulting Engineers
Baker Building Rochester, Penna.

PLATE DESIGNER and ESTIMATOR

Graduate Engineer, Civil or Mechanical with several years experience. We fabricate all types of tanks, stacks and breeching. Work location in large Southern city.

Permanent employment, liberal company benefits, salary commensurate with experience. Write fully in confidence stating experience, education and salary requirements to:

P-8166, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

MECHANICAL ENGINEER

Graduate mechanical engineer with minimum of five years experience, for specialized assignments relating to design, construction, maintenance of pipeline facilities, including pump stations and terminal. Salary good, liberal benefits. Availability for eventual foreign assignment essential.

Write giving full particulars regarding personal history and work experience.

TRANS-ARABIAN PIPE LINE CO.
505 Park Avenue, New York 22, New York

TERMINAL ENGINEERS

CALTEX has openings for Operating Assistants for foreign assignments in the Far East. Candidates should meet following requirements:

- Age 25-35, single preferred.
- Degree in Mechanical or Civil Engineering.
- Prefer 2-3 years' general engineering experience.
- Prefer candidates with some experience in receiving, storage, packaging and shipment of petroleum products; machine maintenance; administrative procedures, and general accounting.

Salary commensurate with background and experience plus living allowance and complete employee benefits.

Send detailed resume to:

CALIFORNIA TEXAS OIL COMPANY, LTD.
380 MADISON AVENUE
NEW YORK 17, NEW YORK
c/o Personnel Dept.

ARCHITECT
$107.00 – $133.00 / wk
ARCHITECTURAL AIDE
$75.00 – $94.00 / wk

Professional Architectural and Structural Engineering work developing plans, specifications, and cost estimates for a long-range building program for the State of Maine.

Qual: College graduate with specialization in architectural design and/or structural engineering. Applicant for position of Architect to be registered or qualified for professional registration.

Vacancies in Augusta, Maine to be filled shortly. *Send resume of education, experience, salaries, personal history, references and a recent photograph to—*

***Atten:* N. C. Bates, Room 400,**
State House, Augusta, Maine

Maine State Department of Finance and Administration
State House, Augusta, Maine

ENGINEERS

STRUCTURAL
HIGHWAY
ELECTRICAL

for work on

Bridges, Expressways, Turnpikes

PERMANENT POSITIONS DEPENDING ON EXPERIENCE AND ABILITY

PAID VACATION, SICK LEAVE HOSPITALIZATION, LIFE INSURANCE

INCLUDE EDUCATION, EXPERIENCE, REFERENCES AND SALARY EXPECTED IN APPLICATION LETTER

Howard, Needles, Tammen & Bergendoff
55 Liberty St. New York 5, N. Y.

ESTIMATORS

Experienced in Process Equipment and piping costs, for Chemical Plant & refinery construction. Position offers good future with progressive Penna. firm. Send resume to

T-95, P. O. BOX 3495
Philadelphia 22, Pa.

WANTED

STEEL SHEET PILING SALES REPRESENTATIVE

for following territories. 1. Ohio, 2. Michigan, 3. Virginia, 4. North Carolina, 5. South Carolina, 6. Alabama, 7. Tenn., 8. Kentucky.

P-8304, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

POSITIONS VACANT
(Continued from page 111)

Structural concrete superintendent for a general contractor doing work in New York State. Must have experience in reinforced concrete grade separation work and following in the trades. State experience and salary desired. Reply to P-8305, Engineering News-Record.

EMPLOYMENT SERVICE

Salaried personnel, $5,000-$30,000. This confidential service, established 1929, is geared to needs of high grade men who seek a change of connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. Jira Thayer Jennings, Dept. L, P. O. Box 674, Manchester, Vermont.

POSITIONS WANTED

Mechanical Engineer, 58 years old, now employed on construction project nearing completion, seeks position of responsibility with engineer, contractor or manufacturer in charge of construction, design or maintenance. Well qualified for all. Good organizer, able administrator. Prefer industrial north-east. $10,000.-$15,000. PW-8038, Engineering News-Record.

Construction Supt. or Gen'l Supt, age 44 good health married civil engineer training, 15 years diversified state, super highway and appurtenance structures, clean character, reliable, good record available Nov 1st, go anywhere. Urgent. PW-8172, Engineering News-Record.

Construction Sup't. over 20 years experience, industrial and high class finished projects. Engineer. Anywhere. Salary $200. PW-8252, Engineering News-Record.

Construction Supervisor — Civil Engineer BSCE 5 years experience in soils, asphalt and concrete. Airfields, rails and highways. Desire foreign work. Go anywhere. Resume on request. Available 15 December. PW-8251, Engineering News-Record.

Construction Superintendent—now completing multi-million dollar S. American assignment, 20 years diversified background, excavation, tunnels, irrigation structures, dams, power plants, pump plants, heavy building, foundations, machinery installation, planning, layout, cost. Age 43, tri-lingual. Salary or % interviews East or West coast. Available Feb, '56, highest references. PW-8329, Engineering News-Record.

Construction Executive, thoroughly experienced industrial, commercial construction; all phases building industry: estimating, buying, field management. PW-8273, Engineering News-Record.

Building construction superintendent, 12 years experience in supervision and estimating, registered professional engineers. Desires permanent position with future. Would prefer to locate in South. PW-8276, Engineering News-Record.

Heavy Equipment Super.—Master Mechanic College graduate—age 35—experienced in all phases of heavy equipment maintenance and operation—plus sand & gravel plant erection & operating experience. PW-8285, Engineering News-Record.

Chief Structural Engineer—Age 54, C.E., registered ,thirty years experience in design and supervision of construction, expressway and railroad bridges, industrial buildings, heavy engineering structures. Client relations, administration, organizing. Desire connection with well established engineering firm. PW-8295, Engineering News-Record.

CONTRACTORS-SURETIES

My Associates and I have taken over and successfully completed more than twenty-five sizeable construction contracts of all types for Sureties and Contractors in the past two years.

We are prepared to handle your problems on almost any basis that will tie in with your own ideas. We sometimes use part or all of the Contractor's present organization, and in other cases we furnish all new administrative personnel for both field and office activities.

If you are a Contractor in financial difficulty on bonded jobs or a Surety with defaulted contracts to complete, we probably can be of real help to you.

Inquiries invited — write or wire

B. F. Bleuer & Associates

116 Mona Drive Buffalo 15, New York

SEARCHLIGHT SECTION

(Classified Advertising)

BUSINESS OPPORTUNITIES EQUIPMENT - USED or RESALE

UNDISPLAYED —RATES— DISPLAYED

$1.80 a line, minimum 3 lines. To figure advance payment count 5 average words as a line.
PROPOSALS, $1.80 a line an insertion.
BOX NUMBERS count as one line additional in undisplayed ads.
DISCOUNT of 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

The advertising rate is $20.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.
AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches—to a page.
EQUIPMENT WANTED or FOR SALE ADVERTISEMENTS acceptable only in Displayed Style.

Send NEW ADVERTISEMENTS to N. Y. Office, 330 W. 42nd St., N. Y. 36, N. Y. for December 1st issue closing November 21st

BUSINESS OPPORTUNITY

For Sale—Established Engineering Co. in Rockford, Ill. Reputation for quality work in utility gas mains and steam main construction, power house piping and propane plant construction. Write Mrs. Kay M. Laswell—Byron, Ill.

Engineers—Foremen—Office Men

Learn latest methods to organize and run work. Prepare for the top jobs.
Send post card for details.

GEO. E. DEATHERAGE & SON CONSTRUCTION CONSULTANTS
P.O. Box 921 Lake Worth, Florida

STRUCTURAL ENGINEERING
ARCHITECTURAL ENGINEERING
OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations. Forty third year.
WILSON *Engineering Corp.*
College House Offices HARVARD SQ. CAMBRIDGE MASS.

T6K MICHIGAN ⅜ Yd. Truck Mounted Shovel, Crane or Backhoe
Rebuilt & Condition Guaranteed Serial No. 7010. New Oct. 1951
RENTAL OR SALE
ANDERSON EQUIPMENT CO.
Box 1737, Pittsburgh 30, Pa.
Phone: LEhigh 1-6020

TWO (2)—LIKE NEW, LETOURNEAU PULLS
Westinghouse Model D Roadsters, powered with GM Diesel engine, with electric starter, equipped with cab, cab heater and defroster, windshield wiper ad horns, muffler and rain cap, mounted on 65" pneumatic tires and complete with E-9 Carryall Scrapers mounted on 18:00x25 pneumatic tires. For quick sale, both for $21,000.00.
FRANK LENTINO
33 Clinton Ave.
Valley Stream, L. I., N. Y.

FOR SALE
1—Rex 200 Double 8" Pumpcrete machine, Tunnel Model, Electric Driven.—700 ft. 8" Pipe.
1—Set new and unused G.E. 100 H.P. Electric Motor, Brakes, and full controls for Hoist, with 20 H.P. motor and controls for swinger.
6—Compressed Air Locks
12—8" Cast Steel Flanged Gate Valves.
GROW CONSTRUCTION CO. INC.
313 W. 53 St., New York 19, N. Y.

For Sale
1—Adams Grader, 1947, Model 512..$3500.00
1—Ford Tractor, 1948..... $900.00
1—Willys Jeep, 1951 ..... $400.00
ROBBINS CONSTRUCTION CORP.
Union, New Jersey *Phone Murdock 6-0505*

If there is anything you want that other readers can supply
OR . . . something you don't want— that other readers can use—
Advertise it in the
SEARCHLIGHT SECTION

WANTED

WHIRLEY CRANE

Clyde Model 20-E or equal. Capable to handle a 3 to 4 yard clam shell bucket, free digging gravel at the rate of 650 cubic yards per hour. Hoisting motor minimum 250 h.p., with ability to operate bucket drums with 22,000 pounds at rate of 330 feet per minute. Swinger motor minimum 50 h.p. with ability to operate boom drum with 30,000 pounds at 170 feet per minute. Crane capacity minimum 21,500 pounds at 30 to 90 feet radius. 2 sheave 100 foot boom. With pedestal, without gantry. Give full particulars as to year, condition, net price and locations.

FRANK BENSON TALLMAN
1158 Fifth Ave., New York 29, N. Y.
ENright 9-1414

WANTED
for Immediate Purchase & Delivery
ONE STIFFLEG DERRICK

Capacity 75 tons with boom at 45 degrees. Length boom 100 to 120 ft. Derrick to be complete with sheaves, wire rope & all fittings. Derrick swing 220 degrees. Hoist to be included. Powered by gasoline or diesel engine. Give hoist line pull and speed when quoting. Supply blueprints when quoting if available.

Answer to
REAGAN EQUIPMENT CO.
P. O. Box 10216, New Orleans 21, La.

WANTED
Michigan one yard tractor shovel
equipped with power shift transmission.
NEWTOWN IRON & STEEL CORP.
180-34 Liberty Jamaica, 33, N. Y.
AXtel 7-9000

WANTED
BELT CONVEYORS
30" or 36" complete. Need approx. 1400 feet or 7 conveyors approx. 200' each.
Write, wire or phone.
G. & W. H. CORSON, INC.,
Plymouth Meeting, Pa.

DIESEL POWER

PORTABLE MOBILE STATIONARY

125 KVA
to
1420 KVA

RENTAL
or
PURCHASE

USE AGSCO POWER
FOR
DEPENDABLE SERVICE

AGSCO STATIONARY POWER UNIT

A. G. SCHOONMAKER COMPANY, INC.

Dept. ENR
P. O. Box 516 Sausalito, Calif.

Dept. ENR
50 Church St., New York 7, N. Y.

PILE DRIVING EQUIPMENT

Vulcan and McKiernan-Terry
Steam Pile Hammers and Extractors
Drop Hammers - Driving Caps
Steel Leads - Pile Driver Hose
Hoists and Boilers

CONTRACTORS MACHINERY CO.

Phone VAlentine 1740 — 2637 SOUTHWEST BLVD KANSAS CITY 8, MO.

SHOVELS DRAGLINES TRACTORS TRUCKS

190-B Bucyrus-Erie 8 yd. electric shovel
170-B Bucyrus-Erie 6 yd. electric shovel
Lima 2400 6 yd. diesel shovel
Lima 1201 3½ yard diesel shovel
54-B Bucyrus-Erie 2½ yd. diesel shovel
37-B Bucyrus-Erie 1¼ yd. diesel shovel
625 Page diesel walker 9 yd., 150' boom
9-W B-E electric walker 8 yd., 200' boom
2400 Lima 5 yd., 130' dragline boom
4500 Manitowoc 5 yd., 120' dragline boom
1400 P & H Electric Dragline 110' boom, 4 yd. Would make good crane. Bargain.
618 Page diesel walker 5 yd. 125' boom
1201 Lima 85' boom 3 yd. drag-crane
3500 Manitowoc 2½ yd. 85' drag
95 Northwest 2½ yd. 70' diesel dragline
955 P&H 85' boom, 2½ yd. diesel dragline
2000 Manitowoc 1½ yd. diesel shovel
604 Lima 65' boom 1½ yd. diesel dragline
34-T Lima 20-ton truck crane
255 PC P&H 20-ton truck crane 80' folding boom, 30' jib
Model 25 Northwest truck crane
58-BH Joy Champion Rotary Air Drill
50R B-E Blast Hole Drill—drills up to 12" hole
2—DW-10 Tractors and 12 yd. Athey side dump wagons
2—520 Garwood 18 yd. scrapers.

Many Good Used Trucks

FRANK SWABB EQUIPMENT CO., INC.
313 Hazleton Natl. Bank Bldg.
Hazleton, Pa. GLadstone 5-3658

FOR SALE or RENT

200 ton American Guy Derrick 160' Bm.
12x14 American #250, 3D Steam Hoist.
25 ton American Stiffleg Model 846.
140 HP 2D Diesel Hoists 15000# SLP.
100 HP Lucey Portable Boilers. 200# WP.
50 ton American Diesel Loco. Crane 1947.
25 ton Ind. Brownhoist No. 5 Diesel Loco. Crane. New 1942.
80 ton Whitcomb Diesel Elec. Loco. 1943.
44 ton GE Diesel Elec. Loco. 1948.
¾ yd Bucyrus 22B Crane-Backhoe 1952.
2½ yd Manitowoc 3500 Diesel Crane.
2½ yd Koehring 1005 Diesel Crane 1952.
60 ton American R-25 Elec. Revolver.
10 ton Unit Mobile Crane Model 1020 12 Tires. New 1946.

MISSISSIPPI VALLEY EQUIPMENT CO.
509 Locust St. St. Louis 1, Mo.

One (1) used Northwest 80-D Shovel, S/N 12636.

One (1) Model 75 Link Belt Crane/Dragline
S/N 1-E-906

One (1) P&H Model 255-A Crane/Dragline
S/N 6724

One (1) Lorain Model L-50 Shovel/Crane/Dragline
S/N 20970

One (1) Link Belt Model LS-52 Crane/Dragline
S/N 6-G-F-451

One (1) Model 304 Koehring Crane/Dragline
Complete with Backhoe Attachment
S/N 5011

Fehrs Tractor & Equipment Co.
1809 Cuming St. Omaha 2, Neb.

EUCLIDS

Used 13 yd. bottom dumps
Cummins & General Motors Powered
Located - Texas - Pa. - N. Y. State
Write, Wire or Phone
L. B. SMITH, INC.
Camp Hill, Penna.
***Tel:* Harrisburg, Regent 7-3431**

FOR SALE OR RENT

1—25 ton Bay City
Truck Crane
Model 190T61
80' Boom plus 30' jib

B. M. WEISS COMPANY
Girard Trust Building
Philadelphia 2, Pa.

FOR SALE

New and Used material—Immediate delivery from stock Angles, Channels, I and WF Beams, especially for Contractors needs

H BEAMS

20 pcs	8" B P	36#	60/65'
35 "	10" B P	42#	60/65
70 "	12" B P	53#	60/65
14 "	12" B P	74#	60/65
20 "	36" W F	230#	44/54'

PILE SECTIONS

Phone or Wire your steel requirements

We are also interested in purchasing your surplus material. We assure you our prices will be the best obtainable.

HY DRACHMAN STEEL CORP.

Warehouse
14-23 34th Avenue, Astoria, New York

Phones
AStoria 8-4484 8-8023

NEW AND REBUILT
STORAGE BATTERY
LOCOMOTIVES
1½ to 10 Ton — 18" to 56" Track Gauge
GREENSBURG MACHINE CO.
Greensburg, Pennsylvania

MANITOWOC
Model 3000B Crane
Independent Boom Hoist. Diesel Engine & Torque Converter. Extra Heavy Boom, 50-ton capacity. Any Length Boom & Jib Guaranteed Rebuilt. RENTAL OR SALE.
ANDERSON EQUIPMENT CO.
Box 1737, Pittsburgh 30, Pa.
***Phone:* LEhigh 1-6020**

USED EQUIPMENT FOR SALE

1—P & H ½ Yd. Crane, gas powered

1—P & H 1 Yd. Shovel & Crane, diesel powered

1—Northwest ¾ Yd. Crane, gas powered

1—Rex 27-E Paver with Mechanical Man

2—TD-18 International Tractors with B.E. 10-14 Yd. Scraper

1—TD-18 International Tractor Angledozer with 12-21 Yd. Scraper

2—LeTourneau - Westinghouse E-9 Rocker Bodies, less wheels & tires

1—LeTourneau - Westinghouse Tournadozer

All size compressors

All size clamshell buckets

FURNIVAL MACHINERY CO.
54th at Lancaster Ave., Phila 31, Pa. • TR 7-5200

SALE OR RENT

TRACTORS—5 D-8's—2 U—16000 SERIES TOP CONDITION WITH NEW OR NEAR NEW TRACKS

AND

SCRAPERS—5 CAT. 80's AND LA TOURNEAU (HD-20 G FRONT LOADER—4½ CU. YD.)

NORTHWEST—80 D—NEW—AND HIGH WITH HEAVY AXLE. SPEED BOOM HOIST 50 TON CAP. 80 FT. BOOM.

AND

NORTHWEST—80 D SHOVEL—LATE MODEL—NO. 25 COMBINATION SHOVEL—CRANE—CLAM

MANITOWOC—4500—140 FT. BOOM—7 YD.—5 YD. BUCKETS

EUCLIDS—3—15 TON END DUMPS

EUCLIDS—12—71 FDT BOTTOM DUMPS

EUCLIDS—10—43 FDT BOTTOM DUMPS
ALL READY TO WORK—30 TO 90 DAYS USE SINCE REBUILT

TRACTORS—2—TD-18's WITH POWER UNIT AND PUSH BLOCK
2—HD-20's WITH POWER UNIT AND PUSH BLOCK

MOTOR GRADERS—3—#12 CAT. 8T SERIES

CONTACT MR. ROBERT B. CLEARY

A. L. DOUGHERTY COMPANY — *CONTRACTORS*

830 SO. PEARL ST.
ALBANY, NEW YORK
PHONE - 32435

10111 SO. TORRENCE AVE.
CHICAGO, ILLINOIS,
PHONE - ESSEX 5-7676

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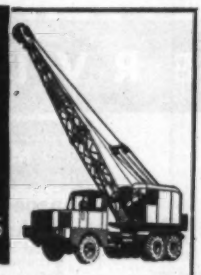

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EDITORIALS

Second Look at the WASHO Road Tests

IN CASE OUR SUMMARY of the WASHO road test results (ENR Oct. 27, p.21) may have been misunderstood as indicating that trucks loaded to the legal limits widely used in this country caused severe damage to pavements designed to carry such loads safely, it appears desirable to state that such is not the case. Most of the damage reported in the test pavements at Malad, Idaho, occurred on road sections that had been deliberately underdesigned. Pavements built to thicknesses corresponding to those called for by the design standards of the western states for their legal loads proved to be ample for those loads.

When the Western Association of State Highway Officials set up the test program, one of the objectives was to determine what minimum thicknesses of pavement were adequate for their current legal load limits when subjected to frequent applications of those loads. The simplest way to do that was to underdesign many of the test pavements. Thus, although the average thickness of surfacing and base courses called for by current design standards in the western states is 18 in., the thicknesses of the test pavements began at 6 in. and ranged up through 10, 14 and 18 to 22 in.

As a consequence of this underdesigning, the test results reported a lot of pavement damage, also that greater damage was done by the more heavily loaded trucks, as was to be expected. On the other hand, speaking generally, the tests showed that pavements of somewhat less thickness than the current standard could carry the legal loads without serious damage.

The test program also demonstrated the importance of paved shoulders to the life of the pavement and to the load-carrying capacity of its outer area. As part of the test program, the distress that developed in the outer wheel path (2½ ft from the edge) was compared with conditions in the inner wheel path (8½ ft from the edge). These studies showed that much more distress developed in the outer wheel path than in the inner path when there was no paved shoulder to provide lateral support. Subsequently, when some of the shoulders were paved with asphaltic concrete of the same thickness as the traffic lane, the faster deterioration of the outer path was stopped. As a result of this development, the research staff concluded that, if paved shoulders are to be used, the overall thickness of the pavement could be reduced 4 in. as compared to a pavement without paved shoulders.

Another important finding was that the superior performance reported for pavements surfaced with 4 in. of bituminous concrete, as compared to those with only 2 in., was due to the slab strength developed by the 4-in. surfacing. Whether the thicker flexible pavements do develop some of the characteristics of a rigid pavement has been a moot question in highway circles for many years. The research staff concluded that their deflection measurements clearly support the "slab-action" theory.

As to the importance of the WASHO test results to a greatly expanded highway program, they appear to provide convincing evidence that no major changes are needed in current practices of the western states in the design of flexible pavements before that program is undertaken. Pavements designed according to present widely used standards should be adequate for the life of that program.

Warehouse Failures Teach A Lesson

MANY LESSONS UNDOUBTEDLY WILL BE LEARNED from the cracked concrete rigid frames in Air Force warehouses that Army engineers are investigating. But the most important one is certain to be that engineers should not adhere blindly to the minimum requirements of building codes.

Investigators report that the 400-ft-long, 6-bay frames are developing cracks at points of low bending moment (ENR Nov. 10, p. 21). They rule out faulty construction and observe that the design is in accord with requirements of the American Concrete Institute building code. The implication is that the code requirements are faulty, particularly those dealing with diagonal tension and bond.

Other studies made since the code was revised in 1951 have indicated that the procedure recommended in the code for determining diagonal-tension reinforcement may not be sufficiently conservative. The ACI is now in the process of revising this procedure.

Does the report then, in effect, absolve all those who had a part in the design of the warehouses of responsibility for the failures if insufficient reinforcement was indeed to blame? Obviously, it cannot, if, as engineers so frequently claim, engineering design demands the exercise of good judgment, not just the ability to substitute numbers in formulas.

To emphasize this, attention might well be called to two other prevalent, questionable practices. One—which also might have played a role in the cracking of the warehouse frames—is the tendency to save steel by stopping the longitudinal reinforcement of concrete beams at points "beyond which it is not needed." Judgment definitely is required in interpreting "need". The second is the practice of applying bond requirements of the ACI code to larger diameter bars than are covered in American Society for Testing Materials Specification A305 for deformed bars. Good judgment is a prime requisite in such an extrapolation.

The importance of exercising judgment in design, pointed up by the warehouse failures, should not go unheeded.

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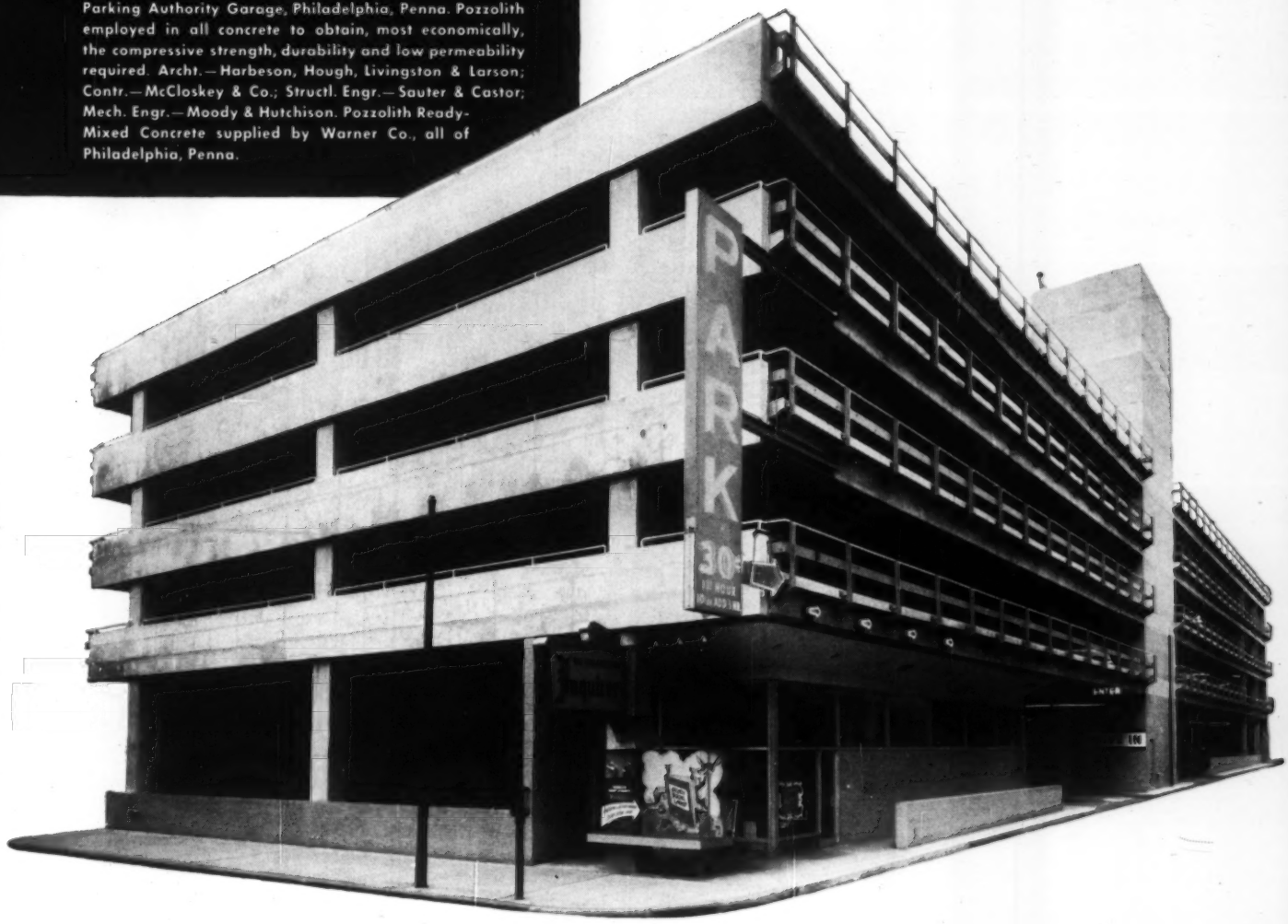

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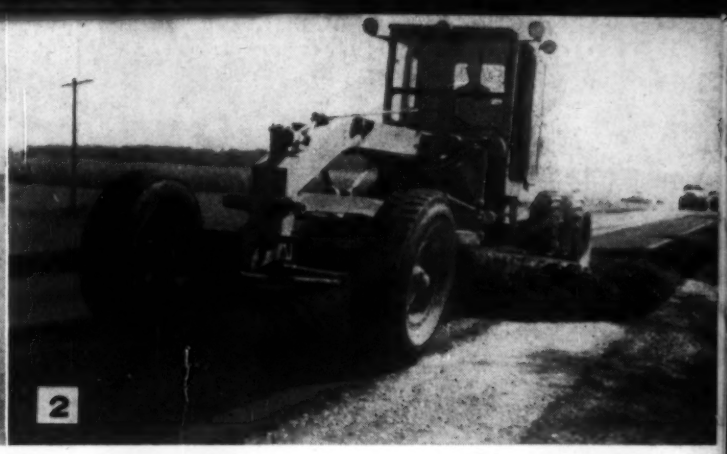

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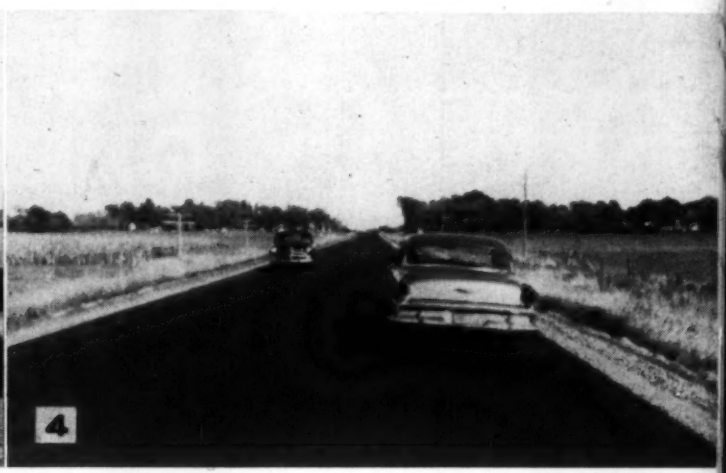

PHOTOGRAPHS

1. Road-mixing machine picks up gravel from windrow, blends it uniformly with Texaco Slow-curing Asphaltic Oil and deposits mix in another windrow.

2. A power grader is used to spread the asphalt-gravel mix over the full width of the road to the desired thickness.

3. Multi-wheel rollers, as well as a conventional steel wheel roller, were used to compact the Texaco Asphalt wearing surface.

4. Completed Todd County road illustrates results obtainable with low-cost gravel and Texaco Asphaltic products.

CONTRACTOR . . . Roland M. Starry
Long Prairie, Minn.

Any county or municipality favored with an ample supply of local gravel can build good roads at low cost by following the example of Todd County, Minn.

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